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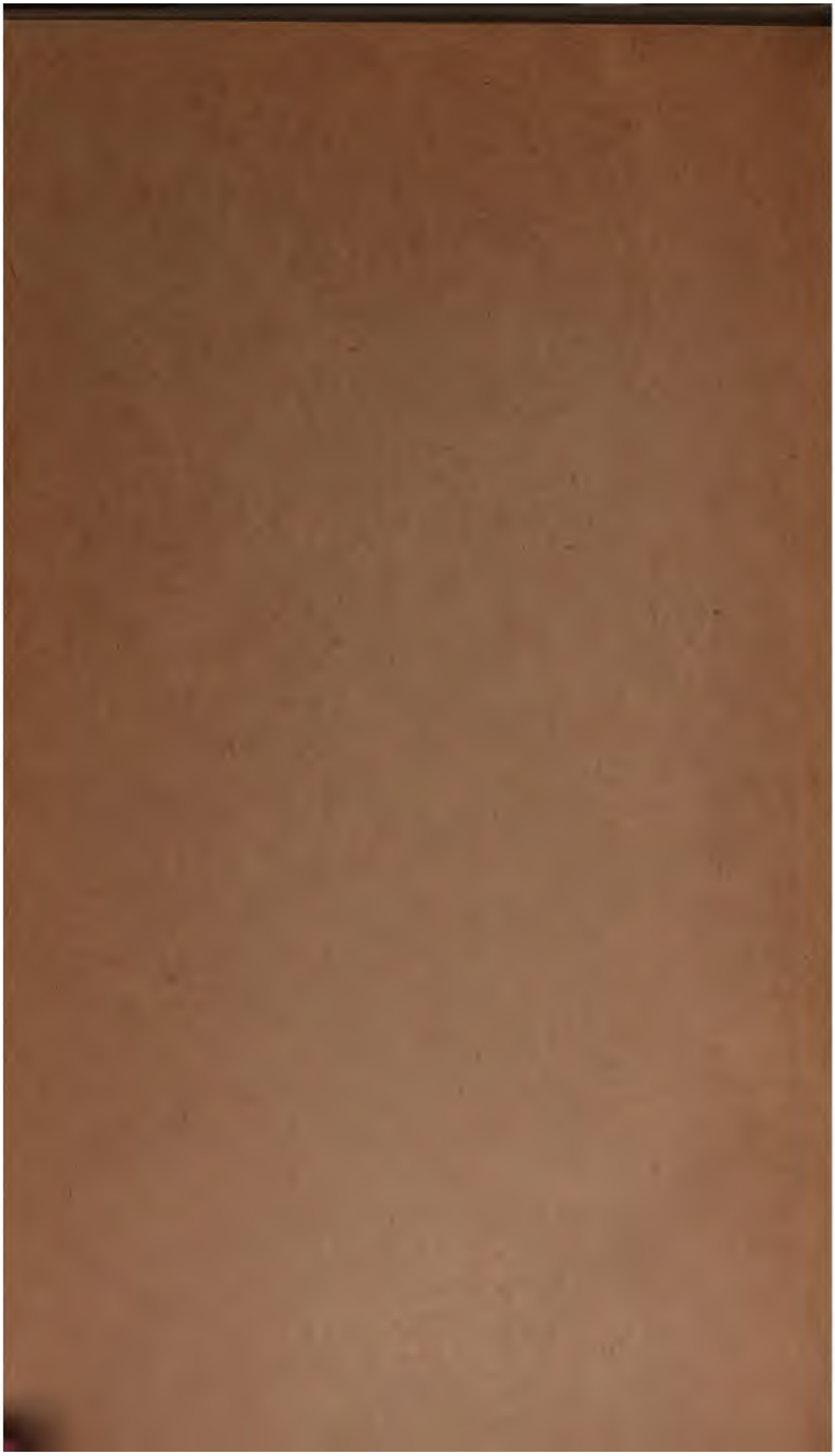
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* Life Fellow.

Date of Election

ALLEN, DR. GLOVER M., 234 Berkeley St., Boston Mass..... (1896)1921[2]
ANTHONY, A. W., Nat. Hist. Mus., Balboa Park San Diego, Calif. (1885)1895
BANGS, OUTRAM, Museum Comp. Zoology, Cambridge, Mass..(1884)1901
BARROWS, Prof. W. B., Box 1047, East Lansing, Mich.....1883
BATCHELDER, CHARLES F., 7 Kirkland St., Cambridge, Mass....Founder
BEEBE, C. WILLIAM, New York Zool. Park, New York, N. Y..(1897)1912
*BENT, ARTHUR CLEVELAND, Taunton, Mass.....(1889)1909
BERGTOLD, DR. W. H. 1159 Race St., Denver Colo.....(1889)1921
*BICKNELL, EUGENE P., 30 Pine St., New York, N. Y.....Founder
BISHOP, Dr. LOUIS B., 356 Orange St., New Haven, Conn..... (1885)1901
BROOKS, ALLAN C., Okanagan Landing, B. C.....(1902)1921
BROWN, NATHAN CLIFFORD, 218 Middle St., Portland, Me.....Founder
CHADBOURNE, Dr. ARTHUR P., The Copley-Plaza, Boston, Mass.(1883)1889
CHAPIN, JAMES P., Amer. Mus. Nat. Hist., New York, N. Y.. (1906)1921
CHAPMAN Dr. FRANK M., Amer. Mus. Nat. His., New York, N. Y. (1885)1888
DEANE, RUTHVEN, 112 W. Adams St., Chicago, Ill.....1883
DWIGHT, Dr. JONATHAN, 43 W. 70th. St. New York, N. Y...(1883)1886
FISHER, Dr. ALBERT K., Biological Survey, Washington, D. C....Founder
FLEMING, JAMES H., 267 Rusholme Road, Toronto, Ontario...(1893)1916
FORBUSH, EDWARD H., State House, Boston, Mass.....(1887)1912
FUERTES, LOUIS A., 201 Wyckoff Ave. Ithaca, N. Y.....(1891)1912
GRINNELL, Dr. GEORGE BIRD, 238 E. 15th St., New York, N. Y.....1883
GRINNELL, Dr. JOSEPH, Mus. Vert. Zool., Univ. Calif., Berkeley, Calif. (1894)1901
JONES, LYNDS, Spear Laboratory, Oberlin, Ohio.....(1888)1905
LOOMIS, LEVERETT M., Cal. Acad. Sci., San Francisco, Calif...(1883)1892
*MAILLIARD, JOSEPH. 1815 Vallejo St., San Francisco, Calif... (1895)1914
MCATEE, WALDO LEE, Biclogical Survey, Washington, D. C.. (1903)1914
*MCGREGOR, RICHARD C., Bureau of Science, Manilla, P. I... (1889)1907
MERRIAM, Dr. C. HART, 1919 16th St., N. W., Washington, D. C..Founder
MILLER, W. DEWITT, Am. Mus. Nat. Hist., New York, N. Y.. (1896)1914

[1] Members of the Union, and subscribers to The Auk are requested to promptly notify DR. WITMER STONE, Acad. Nat. Sciences, Philadelphia, Pa., of any change of address.

[2] Dates in parentheses indicate dates of joining the Union.

MURPHY, Dr. ROBERT C., Amer. Mus. Nat. Hist., New York, N.Y. (1905)1920
NEHRLING, H., Gotha, Fla.....1883
NELSON, Dr. E. W., Biological Survey, Washington, D. C.....1883
OBERHOLSER, DR. HARRY C., Biol. Survey, Washington, D. C. (1888)1902
OSGOOD, Dr. WILFRED H., Field Museum Nat. Hist., Chicago, Ill. (1893)1905
*PALMER, Dr. T. S., 1939 Biltmore St., N. W., Washington D. C. (1888)1901
RICHMOND, Dr. CHARLES W., U. S. Nat. Museum, Washington, D. C. (1888)1897
RIDGWAY, ROBERT, Route 7, Olney, Ill.....Founder
RILEY, JOSEPH H., U. S. Nat. Mus., Washington, D. C.....(1897)1919
ROBERTS, Dr. THOMAS S., Univ. of Minnesota, Minneapolis, Minn...1883
*SAGE, JOHN H., Portland, Conn.....1883
SAUNDERS, WILLIAM E., 240 Central Ave., London, Ontario.....1883
SHUFELDT, Dr. ROBERT W., 3356 18th St., N. W., Washington, D. C. Founder
STONE, Dr. WITMER, Acad. Nat. Sciences, Philadelphia, Pa....(1885)1892
SWARTH, HARRY S., 2906 Pine Ave., Berkeley, Calif.....(1900)1916
TAVERNER, PERCY A., Victoria Memorial Museum, Ottawa, Canada (1902)1917
TODD, W. E. CLYDE, Carnegie Museum, Pittsburgh, Pa.....(1890)1916
WETMORE, Dr. ALEXANDER, Biol. Survey, Washington, D. C..(1908)1919
WIDMANN, OTTO, 5105 Enright Ave., St. Louis, Mo.....1884

RETIRED FELLOWS

FISHER, Prof. W. K., Hopkins Marine Sta., Pacific Grove, Cal. (1899)1920
HENSHAW, HENRY W., The Ontario, Washington, D. C.....(1893)1918
LAWRENCE, NEWBOLD T., Lawrence, N. Y.....(1883)1913
LUCAS, Dr. FREDERIC A., Am. Mus. Nat. Hist., New York N. Y. (1888)1921
STEJNEGER, Dr. LEONHARD, U. S. Nat. Mus., Washington, D. C. (1883)1911

HONORARY FELLOWS

BAKER, E. C. STUART, Chief Police Office, West India Docks, London, E. 14, England.....(1918)1920
BUTURLIN, SERGIUS ALEXANDROVICH, Wesenberg, Esthonia, Russia. (1907)1916
CAMPBELL, ARCHIBALD JAMES, "Bulgaroo," Wellington Road Box Hill, Victoria, Australia.....(1902)1921
CLARKE, Dr. WILLIAM EAGLE, 53 North Castle St., Edinburgh, Scotland.....(1889)1921

DABBENE, Dr. ROBERTO, Museo Nacional, Buenos Aires, Argentina (1916)1918
EVANS, ARTHUR HUMBLE, 9 Harvey Road, Cambridge, England (1899)1917
GADOW, Dr. HANS FRIEDRICH, Cleramendi, Great Shelford, near Cambridge, England.....(1884)1916
GURNEY, JOHN HENRY Keswick Hall, Norwich, England (1883)1921
HAAGNER, ALWIN KARL, Zoological Gardens, Box 754, Pretoria, Transvaal, South Africa..... (1916)1918
HARTERT, Dr. ERNST J. O., Zoological Museum, Tring, Herts, England (1891)1902
HELLMAYR, Dr. CARL E., Neuhauserstrasse 51. II, Munich, Germany (1903)1911
IHERING, Dr. HERMANN VON, Museo Nacional, Peru 208, Buenos Aires, Argentina..... (1902)1911
REV. FRANCIS CHARLES ROBERT JOURDAIN, Appleton Rectory, Abingdon, Berks, England..... (1918)1921
KURODA, NAGAMICHI Fukoyoshi Cho, Akasaka, Tokyo, Japan. (1918)1921
LONNBERG, Dr. A. J. EINAR, Naturhistoriska Riksmuseum, Vetenskapsakademien, Stockholm, Sweden.....(1916)1918
LOWE, Dr. PERCY R., Brit. Mus. (Nat. Hist.), Cromwell Road, London, S. W. 7, England..... (1916)1920
MÉNÉGAUX, Dr. HENRI AUGUSTE, Museum d'Histoire Naturelle, 55 Rue de Buffon, Paris, France..... (1916)1918
PYCRAFT, WILLIAM PLANE, British Museum (Nat. Hist.) Cromwell Road, London, S. W., 7, England (1902)1911
REICHENOW, Dr. ANTON, Königl. Mus. für Naturkunde, Invalidenstrasse, 43, Berlin, Germany..... (1884)1891
ROTHSCHILD, Lord LIONEL WALTER, Zoological Museum, Tring, Herts, England (1898)1913
SALVADORI, Count TOMMASO, Royal Zool. Museum, Turin, Italy.... 1883
SCHALOW, Prof. HERMAN, Hohenzollerndamm 50, Berlin-Grünewald, Germany..... (1884)1911
SCLATER, WM. LUTLEY, 10 Sloane Court, Chelsea, London, S. W. 1. England..... (1906)1917
SUSCHKIN, Dr. PETER P., University, Kharkov, Russia.....(1903)1918
VAN OORT, Dr. E. D., Mus. Nat. Hist., Leyden, Holland....(1913)1919

CORRESPONDING FELLOWS

ABBOTT, Dr. WILLIAM L., 400 S. 15th St., Philadelphia, Pa.....1916
ALEXANDER, WILFRED B., Inst. Sci. and Industry, William St., Brisbane, Queensland, Australia.....1921
ALFARO, DON ANASTASIO, San José, Costa Rica.....1888

ARRIBALZAGA, ENRIQUE LYNCH, Resistencia, Chaco, Argentina.....1918
ARRIGONI DEGLI ODDI, Count ETTORE, Univ. of Padua, Padua, Italy 1900
ASHBY, EDWIN, Wittunga, Blackwood, Adelaide, South Australia....1918
BANNERMAN, DAVID ARMITAGE, 6 Palace Gardens Terrace, Kensington, London, W. 8, England.....1916
BATE, Miss DOROTHEA M. A., Bassenden House, Gordon, Berwickshire, Scotland.....1920
BATES, GEO. LATIMER, Bitye, via Ebolowa, Cameroon, W. Africa....1919
BAXTER, Miss EVELYN VIDA, The Grove, Kirkton of Largo, Fifeshire, Scotland.....1919
BEDDARD, FRANK EVERS, Zoöl. Soc., Regents Park, London, England. 1917
BERTONI, Dr. ARNOLDO de WINKELREID, Puerto Bertoni, Paraguay..1919
BLAAUW, FRANS ERNST, Goorlust 'sGraveland, Hilversum, Holland..1920
BONHOTE, JOHN LEWIS, Park Hill House, Carshalton, England.....1911
BUREAU, Dr. LOUIS, École de Médicine, Nantes, France.....1884
BÜTTIKOFER, DR. JOHANNES, Zoölogical Garden, Rotterdam, Holland1886
CARRIKER, M. A., Jr., Apartado 51, Santa Marta, Colombia. (1907) 1912
CARTER, THOMAS, Wensleydale, Mulgrave Rd., Sutton, Surrey, England 1921
CHAMBERLAIN, MONTAGUE, 259 Newbury St., Boston, Mass. (Founder) 1901
CHAPMAN, ABEL, Houxty, Wark-on-Tyne, Northumberland, England..1921
CHROSTOWSKI, TADEUSZ, Muzeum, Przyrodnicze, Krakowski-Przedmiescie 26–28, Warsaw, Poland. 1921
CHUBB, CHARLES, British Museum (Nat. Hist.) Cromwell Road, London, S. W., 7. England.....1911
COLLINGE, Dr. WALTER E., The Museum, York, England.....1918
DALGLEISH, JOHN J., Brankston Grange, Bogside Station, Alloa, Scotland.....1883
DELACOUR, JEAN, Chateau de Cleres, Seine Inférieure, France.....1920
DOLE, SANFORD B., Honolulu, Hawaii.....1883
ECHT, ADOLPH BACHOFEN VON, Nussdorf, near Vienna, Austria.....1883
ELWES, HENRY JOHN, Colesborne, Cheltenham, Gloucestershire, England.....1921
FERRARI-PEREZ, Prof. FERNANDO, Tacubaya, D. F., Mexico.....1885
FREKE, PERCY EVANS, South Point, Limes Road, Folkstone, England 1883
GEE, NATHANIEL GIST, Summerton, S. C. 1919
GHIGI, Dr. ALESSANDRO, R. Univ. Bologna, Italy 1921
GODWIN-AUSTEN, Lieut.-Col. HENRY HAVERSHAM, Nore, Hascombe, Godalming, Surrey, England 1884
GRANT, Major CLAUDE HENRY BAXTER, c o chief Sect'y to Govt, Dar-es-Salaam, Tanganyika Ter., E. Africa.....1920
GYLDENSTOLPE, Count NILS, Naturhistoriska Riksmuseum, Vetenskap-sakademien, Stockholm, Sweden.....1918

HALL, ROBERT, Tasmanian Museum, Hobart, Tasmania.....1916
HARTING, JAMES EDMUND, Portmore Lodge, Weybridge, Surrey, England.....1883
HAVILAND, Miss MAUD D., Old Hall, Newnham College, Cambridge, England.....1920
HELMS, Dr. O., Sanatoriet ved Nakkeböllefjord pr Pejruk, Denmark 1920
HENNICKE, Dr. CARL R., Gera, Reuss, Germany.....1907
HENSON, HARRY V., c/o Hong Kong and Shanghai Banking Corp., 9 Grace Church St., London, E. C., England.....1888
HUDSON, WILLIAM HENRY, Tower House, St. Luke's Road, Westbourne Park, London, W., England.....1895
HULL, ARTHUR FRANCIS BASSETT, Box 704, Sydney, N. S. W.....1919
INGRAM, CAPT. COLLINGWOOD, The Grange, Benenden Cranbrook, Kent, England.....1920
IREDALE, TOM, 39 Northcote Ave., Ealing, London, W. 5, England..1918
KLOSS, CECIL BODEN, Kuala Lumpur, Federated Malay States.....1918
LATOUCHE, JOHN DAVID DIGUES, 24 Earlsport Terrace, Dublin, Ireland.....1921
LEACH, Dr. JOHN ALBERT, Eyrecourt, Canterbury, Victoria, Australia 1919
LE SOUÉF, DUDLEY, Zoological Gardens, Melbourne, Australia.....1911
LODGE, GEORGE EDWARD, Hawkhouse, Park Road, Camberley, Surrey, England.....1921
MADÁRASZ, Dr. JULIUS VON, Matyas Sir 14, Budapest, Hungary.....1884
MARIA, HERMANO APOLINAR, Instituto de la Salle, Bogota, Colombia 1921
MATHEWS, GREGORY M., Foulis Court, Fair Oak, Hants, England...1911
MATTINGLY, ARTHUR HERBERT E., Custom House, Melbourne, Australia 1921
MEINERTZHAGEN, Mrs. ANNIE C., Swordale, Evanton, Ross-shire, Scotland.....1919
MEINERTZHAGEN, Col. RICHARD, 63 Bedford Gardens, Kensington, W. 3, London, England.....1921
MENZBIER, Prof. Dr. MICHAEL, University for Women, Devitchje, Pola, Moscow, Russia.....1884
MILLAIS, JOHN GUILLE, Compton's Brow, Horsham, Sussex, England 1911
MITCHEL, Dr. P. CHALMERS, Zoological Society, Regents Park, London, N. W. 8, England.....1919
MOFFETT, LACY I., 5 Quinsan Gardens, Shanghai, China.....1919
NICHOLSON, FRANCIS, Ravenscroft, Windermere, Westmoreland, England.....1884
NICOLL, MICHAEL JOHN, Valhalla House, Zool. Gardens, Giza, Egypt1919
OGILVIE-GRANT, WILLIAM ROBERT, Farley Hill Cottage, Reading, England.....1899
PHILLIPS, MONTAGU AUSTIN, Devonshire House, Reigate, Surrey, England.....1919

RAMSDEN, Dr. CHARLES T., Box 146, Guantanamo, Cuba....(1912) 1918
RIBEIRO, Dr. ALIPIO de MIRANDA, Therigopolis, Estado de Rio Janeiro, Brazil.....1921
RINGER, FREDERIC, Nagasaki, Japan.....1888
RINTOUL, Miss LEONORE JEFFREY, Lahill Largo, Fifeshire, Scotland 1919
ROBERTS, AUSTEN, Pretoria, South Africa.....1920
ROBINSON, HERBERT C., Selangor State Museum, Kuala Lumpur, Federated Malay States.....1918
SETH-SMITH, DAVID, 34 Elsworthy Road, South Hampstead, London, N. W. 3, England.....1920
SHÖLER, Dr. E. LEHN, Uraniavej 14–16, Copenhagen, Denmark.....1920
SNETHLAGE, Dr. EMILIA, Museu Goeldi, Pará, Brazil.....1915
SNOUKAERT VON SCHAUBURG, Baron RENÉ C. E. G. J. van, Doorn, Holland.....1920
SWANN, H. KIRKE, Thorncombe, Lyonsdown Road, New Barnet, Herts. England.....1919
SWYNNERTON, C. F. M., Poste Restante, Dar-es-Salaam, Tanganyika Ter. East Africa.....1918
THEEL, Dr. JOHAN HJALMAR, University of Upsala, Upsala, Sweden 1884
TICEHURST, N. F., 24 Pevensey Road, St. Leonards-on-Sea, England 1918
TSCHUSI ZU SCHMIDHOFFEN, VICTOR, RITTER VON, Villa Tännenhof, bei Hallein, Salzburg, Austria.....1884
TURNER, Miss EMMA L., Langton Close, Girton, Cambridge, England 1920
UCHIDA, SEINOSUKE, No. 1, 1-chome, Kitamachi, Aoyama, Tokyo, Japan.....1919
VAN SOMEREN, Dr. VICTOR G. L., Box 140, Nairobi, British East Africa 1921
WHISTLER, HUGH, c/o. King, King & Co., Bombay, India.....1921
WHITE, HENRY LULLE, Belitrees, Scone, New South Wales.....1920
WHITE, Capt. SAMUEL ALBERT, Wetunga, Fulham, South Australia. 1919
WINGE, Dr. HERLUF, Univ. Zoöl. Museum. Copenhagen, Denmark 1903
WITHERBY, HARRY FORBES, 12 Chesterford Gardens, Hampstead, London, N. W. 3, England.....1916
WORCESTER, Prof. DEAN C., Manila, P. I.....1903
ZELEDON, DON JOSÉ C., San José, Costa Rica.....1884

MEMBERS.

*Life Members

ALLEN, Dr. ARTHUR A., McGraw Hall, Cornell Univ., Ithaca, N. Y. (1909)1914
ALLEN, FRANCIS H., 4 Park St., Boston, Mass.....(1888)1901
ANDERSON, Dr. R. M., Mus. Geol. Survey, Ottawa, Canada...(1907)1914
ATTWATER, H. P., 2120 Genesee St., Houston, Texas.....(1891)1901

BAILEY, VERNON, 1834 Kalorama Ave., Washington, D. C. ... (1887)1901
BAILEY, Mrs. VERNON, 1834 Kalorama Road, Washington D.C. (1885)1901
BAILY, WILLIAM L., 220 E. Lancaster Road, Ardmore, Pa. (1886)1901
*BALDWIN, S. PRENTISS, Williamson Bldg., Cleveland, Ohio ... (1917)1921
BARBOUR, Dr. THOMAS, Mus. Comp. Zoology, Cambridge, Mass. (1903)1914
BARTSCH, Dr. PAUL, U. S. Nat. Museum, Washington, D. .. C. (1896)1902
BECK, ROLLO HOWARD, c/o Amer. Consul, Papeete, Tahiti ... (1894)1917
BOND, FRANK, 3027 Newark St., N. W., Cleveland Park, D. C. (1887)1901
BOWLES, JOHN HOOPER, The Woodstock, Tacoma, Wash. (1891)1910
BRAISLIN, Dr. WILLIAM C., 425 Clinton Ave., Brooklyn, N. Y. (1894)1902
BROOKS, WM. SPRAGUE, 234 Berkeley St., Boston, Mass. (1907)1917
BRYAN, WM. ALANSON, Museum, Exposition Park, Los Angeles, Calif. (1898)1901
BRYANT, Dr. HAROLD CHILD, Mus. Vert. Zool. Berkeley, Calif. (1913)1918
BURNS, FRANK L., Berwyn, Pa. (1891)1901
BUTLER, AMOS W., 52 Downey Ave., Irvington, Indianapolis, Ind. (1885)1901
CHAMBERS, W. LEE, Box 4, Eagle Rock, Calif. (1907)1913
CHERRIE, GEORGE K., Newfane, Vt. (1891–1912) (1917) 1918
CLARK, Dr. HUBERT L., Mus. Comp. Zool. Cambridge, Mass. . (1886)1902
DAWSON, WM. L., R. D. 1, Santa Barbara, Calif. (1895)1905
DEANE, WALTER, 29 Brewster St., Cambridge, Mass. (1897)1901
EATON, Prof. ELON HOWARD, 678 Main St., Geneva, N. Y. (1895)1907
EVERMANN, Prof. B. W., Calif. Acad. Sci., San Francisco, Calif (1883)1901
FARLEY, JOHN A., 52 Cedar St., Malden, Mass. (1904)1919
FINLEY, WILLIAM L., Jennings Lodge, Clackamas Co., Ore. ... (1904)1907
FORDYCE, GEO. L., 40 Lincoln Ave., Youngstown, Ohio (1901)1921
GABRIELSON, IRA N., 515 P. O. Bldg., Portland, Ore. (1912)1920
GAULT, BENJAMIN TRUE, 2313 Washington Blv'd., Chicago, Ill (1885)1903
GOLDMAN, EDWARD A., Biological Survey, Washington, D. C. (1897)1902
GRISCOM, LUDLOW, 37 5th Ave., New York, N. Y. (1908)1918
HARPER, FRANCIS, Zool. Lab., Cornell Univ., Ithaca, N. Y. (1907)1917
*HARRIS, HARRY, 18 West 52nd St., Kansas City, Mo. (1911)1919
HERRICK, Prof. FRANCIS H., Adelbert College, Cleveland, O. .. (1913)1919
HERSEY, F. SEYMOUR, 6 Maple Ave., Taunton, Mass. (1911)1916
HOFFMAN, RALPH, Santa Barbara School, Carpenteria, Calif. .. (1893)1901
HOLLISTER, NED, Nat. Zoölogical Park, Washington, D. C. ... (1894)1910
HOWELL, A. B., 770 S. Pasadena Ave., Pasadena, Calif. (1909)1916
HOWELL, ARTHUR H., 2919 S. Dakota Ave., Washington, D. C (1889)1902
JACOBS, J. WARREN, 404 S. Washington St., Waynesburg, Pa. . (1889)1904
JEFFRIES, WILLIAM A., 11 Pemberton Square, Boston, Mass. . (1883)1901
JOB, HERBERT K., 601 Washington Ave., West Haven, Conn. . (1896)1901
KALMBACH, EDWIN R., Biological Survey, Washington, D. C. . (1910)1915

*KENNARD, F. H., Dudley Road, Newton Centre, Mass.....(1892)1912
KNOWLTON, Dr. F. H., U. S. Nat. Mus., Washington, D. C... (1883)1902
*LAW, J. EUGENE, Box 181, Altadena, Calif.....(1907)1916
LINCOLN, F. C., Biological Survey, Washington, D. C.....(1910)1921
MACKAY, GEORGE H., 110 State St., Room 203, Boston, Mass. (1890)1901
MAILLIARD, JOHN W., 230 California St., San Francisco, Calif. (1895)1901
MILLER, Dr. LOYE HOLMES, Southern Branch Univ. Calif., Los Angeles, Calif.....(1918)1920
MOORE, ROBERT THOMAS, Onawa, Me.....(1898)1914
MORRIS, GEORGE SPENCER, Olney, Philadelphia, Pa.....(1887)1914
MORRIS, ROBERT O., 82 Temple St., Springfield, Mass.....(1888)1904
MURDOCH, JOHN, 16 High Rock Way, Allston, Mass.....(1883)1903
NICHOLS, JOHN T., Am. Mus. Nat. Hist., New York, N. Y....(1901)1910
NORTON, ARTHUR H., Mus. Nat. Hist., 22 Elm St., Portland, Me. (1890)1902
PEARSON, T. GILBERT, 1974 Broadway, New York, N. Y.....(1891)1902
PENARD, THOMAS E., 12 Norfolk R'd, Arlington, Mass.....(1912)1919
PENNOCK, CHAS. J., Kennett Square, Pa.....(1888)1901
PETERS, JAMES LEE, Harvard, Mass.....(1904)1918
PHILLIPS, Dr. JOHN C., Wenham, Mass.....(1904)1912
PREBLE, EDWARD A., Biological Survey, Washington, D. C....(1892)1901
RATHBURN, SAMUEL F., 217 14th Ave. N., Seattle, Wash.....(1893)1902
RHOADS, SAMUEL N., 81 Haddon Ave., Haddonfield, N. J.....(1885)1901
RIVES, Dr. WM. C., 1702 Rhode Island Ave., Washington, D. C. (1885)1901
ROBINSON, Col. WIRT, U. S. A., West Point, N. Y.....(1897)1901
*ROGERS, CHARLES H., Nassau Inn, Princeton N. J.....(1904)1921
SAUNDERS, ARETAS A., 48 Longview Ave., Fairfield, Conn.....(1907)1920
SETON, ERNEST THOMPSON, Greenwich, Conn.....(1883)1901
*SHERMAN, Miss ALTHEA R., National via McGregor, Iowa... (1907)1912
*SHIRAS, Hon. GEORGE, 3d, Stoneleigh Court, Washington, D. C. (1907)1915
STEPHENS, FRANK, Nat. Hist. Museum, San Diego, Calif.....(1883)1901
STEPHENS, Prof. T. C., Morningside College, Sioux City, Iowa.(1909)1920
STRONG, Dr. REUBEN M., 706 S. Lincoln St., Chicago, Ill..... (1889)1903
*SWALES, BRADSHAW HALL, U. S. Nat. Mus., Washington D. C., (1902)1909
SWENK, MYRON W., 1410 N. 37th St., Lincoln, Neb.....(1904)1920
THAYER, JOHN ELIOT, Lancaster, Mass.....(1898)1905
TOWNSEND, Dr. CHARLES H., Aquarium, Battery Park, New York, N. Y.....(1883)1901
TOWNSEND, Dr. C. W., 98 Pinckney St., Boston, Mass.....(1901)1905
TROTTER, Dr. SPENCER, Swarthmore College, Swarthmore, Pa.(1888)1901
TYLER, Dr. WINSOR M., 522 Mass. Ave., Lexington, Mass....(1912)1917
WARREN, E. R., 1511 Wood Ave., Colorado Springs, Colo.....(1902)1910

WAYNE, ARTHUR T., Mt. Pleasant, S. C.....(1905)1906
WILLETT, GEORGE, Wrangell, Alaska.....(1912)1914
*WILLIAMS, ROBERT WHITE, Dept. Agric., Washington, D. C..(1900)1918
WOLCOTT, Dr. ROBERT H., State University, Lincoln, Neb....(1901)1903
*WOOD, Dr. CASEY A., 7, W. Madison St., Chicago, Ill.....(1917)1921
WOOD, NORMAN A., Museum Univ. of Mich. Ann Arbor, Mich.(1904)1912
WRIGHT, Dr. ALBERT H., Upland Road, Ithaca, N. Y.....(1906)1919
WRIGHT, Mrs. MABEL OSGOOD, Box 32, Fairfield, Conn.(1895)1901

ASSOCIATES

*Life Associates

ABBOTT, CLINTON GILBERT, 4290 Sierra Vista, San Diego, Calif.....1898
ABBOTT, Miss HARRIET, Fryeburg, Me.....1918
ABBOTT, WALDO L., Hotel Somerset, Boston, Mass.....1921
ACHORN, Dr. JOHN W., Pine Bluff, N. C.....1921
ADAMS, BENJAMIN, Wethersfield, Conn.....1911
ADAMS, Rev. CHARLES L., New Canaan, Conn.....1920
ADAMS, WILLIAM C., 43 Clyde St., Newtonville, Mass.....1920
ADAMS, Dr. Z. B., 43 Cottage Farm Road, Longwood, Mass.....1908
ADELMANN, HOWARD BERNHARDT, Stimson Hall, Cornell Univ., Ithaca N. Y.....1919
AHRENS, Dr. T. G., Landanerstrasse 4, Berlin-Wilmersdorf, Germany1920
AIKEN, Hon. JOHN, Superior Court, Court House, Boston, Mass....1905
AIMAR, Dr. CHARLES PONS, 4 Vanderhorst St., Charleston, S. C.....1916
*ALEXANDER, Miss ANNIE M., Box 248 Suisun City, Calif.....1911
ALEXANDER, EDWARD GORDON, E. Arrow St., Marshall, Mo.....1919
ALLEN, Mrs. AMELIA SANBORN, 37 Mosswood R'd, Berkeley, Calif.. 1919
ALLEN, ARTHUR F., Box 717 Sioux City, Iowa.....1919
ALLEN, MARY P., 206 Moore St., Hackettstown, N. J.....1913
ANDERSON, EDWIN C., Dell Rapids, S. D.....1919
ANDERSON, Mrs. J. C., Great Barrington, Mass.....1903
ANGELL, WALTER A., 33 Westminster St., Providence, R. I.....1901
ANKENEY, Miss HELEN, Rt. 10, Xenia, Ohio.....1920
ANTHONY, H. E., Amer. Mus. Nat. Hist., New York, N. Y.....1911
ARMITAGE, LUCIUS, 282 E. 162nd St., New York, N. Y.....1918
ARMOUR, Mrs. GEORGE, Allison House, Princeton, N. J.....1920
ARMSTRONG, EDWARD E., 2249 Calumet Ave., Chicago, Ill.....1904
ARNOLD, EDWARD, Grand Trunk R'y., Montreal, Quebec 1894
ARNOLD, Dr. W. W., 504 N. Nevada Ave., Colorado Springs, Colo...1910
ARTHUR, EDMUND WATTS, 7438 Perrysville Ave., Ben Avon, Pittsburgh, Pa.....1919
ARTHUR, STANLEY CLISBY, 6043 Perrier St., New Orleans, La. 1916

ASPINWALL, Mrs. CLARENCE A., 1839 Wyoming Ave., Washington, D. C.....1916
ATHERTON, EDWARD H., 22 Aldworth St., Boston, 30, Mass.....1917
ATWELL, GEORGE, C., Strafford, N. H.....1920
AVERILL, CHARLES KETCHUM, 406 Stratford Ave., Bridgeport, Conn. 1919
AYRES, Miss MARY ADELINE, 119 High St., Medford Mass.....1915
BABCOCK, CLYDE H., 3426 W. Kiowa St., Colo. Springs, Colo.....1920
BABCOCK, Dean, Long's Peak, Colo.....1911
BACON, FRANCIS L., 236 Winona Ave., Germantown, Pa.....1917
BADÉ, Dr. WM. FREDERIC, 2616 College Ave., Berkeley, Calif.....1916
BADGER, ARTHUR C., 167 Dudley Road, Newton Centre, Mass.....1917
BADGER, LESTER R., 2401 Lake Place, Minneapolis, Minn.....1920
BAER, JOHN LEONARD, Apt. 1, The Maury, 19th & G Sts., N. W., Washington, D. C.....1920
*BAGG, AARON C., 70 Fairfield Ave., Holyoke, Mass.....1916
BAGG, EGBERT, 406 Genesee St., Utica, N. Y.....1916
BAGG, JOHN LEONARD, 89 Lexington Ave., Holyoke, Mass.....1918
BAILEY, ALFRED M., Colorado Mus. Nat. Hist., Denver, Colo.....1918
BAILEY, Prof. GUY A., Geneseo, N. Y.....1910
BAILEY, SAMUEL WALDO, 64 S. Mountain R'd., Pittsfield, Mass.....1909
BAIRD, Miss KATHERINE B., 815 Webster St., N. W., Washington, D. C.....1918
BAIRD, ROBERT LOGAN, 279 Oak St., Oberlin, Ohio.....1921
BAKER, JACK D., Willets, Mendocino Co., Calif.....1920
BALES, Dr. BLENN R., 149 W. Main St., Circleville, Ohio.....1907
BALL, Mrs. BENNET F., Oakville, Conn.....1905
BALL, EDWARD M., East Falls Church, Va.....1918
BALL, Dr. Jos. P., 5001 Frankford Ave., Philadelphia, Pa.....1911
BANCROFT, GRIFFING, 2525 First St., San Diego, Calif.....1921
BARBER, Prof. BERTRAM A., Hillsdale College, Hillsdale, Mich.....1920
BARBER, FURNALD K., La Fox, Kane Co., Ill.....1920
BARBOUR, Rev. ROBERT, Y. M. C. A., Montclair, N. J.....1902
BARCLAY, WILLIAM, Barré, Vermont.....1921
BARLOW, HENRY HOYT, 3131 16th St., N. W., Washington, D. C....1921
BARKER, Miss HELEN, 421 E. Adams St., Sandusky, O.....1918
BARNARD, Judge JOB, 1401 Fairmont St., Washington, D. C.....1886
BARNARD, T. W., 46 Norfolk Road, Arlington, Mass.....1921
BARNES, CHARLES SYDNEY, 19 W. 31st St., Bayonne, N. J.....1920
BARNES, CLAUDE T., 359 Tenth Ave., Salt Lake City, Utah.....1908
BARNES, Hon. R. MAGOON, Lacon, Ill.....1889
BARRETT, CHAS. H. M., 1339 Valley Place S. E., Washington, D. C... 1912
BARRETT, HAROLD LAWRENCE, 172 Huntington Ave., Boston, Mass... 1909
BARROWS, IRA, 15 Maiden Lane, New York, N. Y.....1920
BARRY, Miss ANNA K., 5 Bowdoin Ave., Dorchester, Mass.....1907
BARTLETT, Miss MARY F., 227 Commonwealth Ave., Boston, Mass..1912

BARTRAM, EDWIN B., Bushkill, Pike Co., Pa.....1913
BASSETT, FRANK NEWTON, 1338 8th St., Alameda, Calif.....1919
BATES, Miss EMELINE CLARK, 59–69 Scott St., Chicago, Ill.....1920
BATES, Rev. J. M., Red Cloud, Neb.....1918
BATTEN, GEORGE, 46 Lloyd Road, Montclair, N. J.....1914
BAYNES, ERNEST HAROLD, Meriden, N. H.....1918
BEARD, THEODORE R., 970 Lincoln Place, Boulder, Colo.....1920
BECK, HERBERT H., Lititz, Lancaster Co., Pa.....1921
BECKFORD, ARTHUR W., 10 Park Place, Boulder, Colo.....1919
BELL, Dr. W. B., Biological Survey, Washington, D. C.....1912
BENJAMIN, Mrs. ALFRED, 350 Summer Ave., Newark, N. J.....1920
BENKENSTEIN, Hon. L. J., U. S. Commissioner, Beaumont, Tex.....1921
BENNETT, Rev. GEORGE, Iowa City, Iowa.....1913
BENSON, FRANK W., 46 Washington Sq., Salem, Mass.....1920
BERLIN, Mrs. CORA D., 423 Fourth St., Marietta, Ohio.....1920
BERMAN, DANIEL, 70 Morningside Drive, New York, N. Y.....1919
BICKNELL, Mrs. F. T., 319 S. Normandie Ave., Los Angeles, Calif...1913
BIDDLE, Miss EMILY WILLIAMS, 2201 Sansom St., Philadelphia, Pa .1898
BIGELOW, Mrs. A. P., Ogden, Utah.....1919
BIGELOW, Dr. LYMAN F., 80 Winter St., Norwood, Mass.....1914
BIGELOW, Dr. WILLIAM STURGIS, 56 Beacon St., Boston, Mass.....1920
BISCHOFF, FRANK L., Rock Port, Mo.....1921
BISHOP, SHERMAN C., N. Y. State Museum, Albany, N. Y.....1919
BLACKWELDER, ELIOT, 740 Olive St., Denver, Colo.....1895
BLAISDELL, Miss RUTH, 126 Grand View Ave., Wollaston 10, Mass..1920
BLAKE, BENJAMIN S., Auburndale 66, Mass.....1920
BLINCOE, BENEDICT J., Rt. 13, Dayton, Ohio.....1921
BLOOMFIELD, Mrs. C. C., 723 Main St. W., Jackson, Mich.....1901
BLOWERS, Miss AGNES, Rt. 2, Morrisville, N. Y.....1920
BLUMHARDT, GUSTAV, 80 Hunter Ave., Maywood, N. J.....1921
BOARDMAN, Miss E. D., 416 Marlborough St., Boston, Mass.....1906
BODINE, Mrs. DONALDSON, 4 Mills Place, Crawfordsville, Ind.....1916
BOEHNER, REGINALD STEPHEN, Syracuse Univ., Syracuse, N. Y.....1919
BOGARDUS, Miss CHARLOTTE, Elm St., Coxsackie, N. Y.....1909
BOLT, BENJAMIN FRANKLIN, 1421 Prospect Ave., Kansas City, Mo..1909
BOND, HARRY L., Lakefield, Minn.....1908
BONFILS, FREDERICK G., The Denver Post, Denver, Colo.....1918
BONNETT, D. B., Bay Head, N. J.....1920
BOSSON, CAMPBELL, 19 Brewster St., Boston, Mass.....1906
*BOULTON, WM. B., Morristown Trust Co., Morristown, N. J.....1919
BOULTON, W. R., Jr., Beaver, Pa.....1921
BOURNE, THOMAS L., Hamburg, N. Y.....1913
BOWDEN, Miss ENID, 305 Waverly St., Ottawa, Ont.....1921
BOWDEN, Mrs. MARIE L., 305 Waverly St., Ottawa, Ont.....1921
BOWDISH, B. S., Demarest, N. J.....1891
BOWDISH, Mrs. B. S., Demarest, N. J.....1902

BOWDITCH, Dr. HAROLD, 44 Harvard Ave., Brookline, Mass.....1900
BOWEN, MAURICE S., Box 327 Middleboro, Mass.....1921
BOYD, DONALD H., Box 466, Hobart, Ind.....1920
BOYD, Mrs. HARRIET T., 17 Marsh St., Dedham, Mass.....1917
BOYLE, ASHBY D., 380 E. St., Salt Lake City, Utah.....1921
BRACKEN, Mrs. HENRY M., 1010 Fourth St., S. E., Minneapolis, Minn.1897
BRADBURY, W. C., 1440 Race St., Denver, Colo.....1915
BRADLEE, THOMAS STEVENSON, South Sudbury, Mass.....1902
BRADSHAW, FRED, Regina, Sask.....1921
BRAINERD, Dr. JOHN BLISS, 419 Boyleston St., Boston, Mass.....1921
BRALLIAR, FLOYD, Madison, Tenn.....1921
*BRANDRETH, COURTNEY, Ossining, N. Y.....1905
*BRANDRETH, FRANKLIN, Ossining, N. Y.....1889
BRANDT, HERBERT W., 2025 East 88th St., Cleveland, Ohio.....1915
BRANNON, PETER A., Box 358, Montgomery, Ala.....1919
BREDER, CHAS. M. Jr., 23 Humboldt St., Newark, N. J. 1919
BREWSTER, Mrs. WILLIAM, The Charlesgate, 535 Beacon St., Boston, Mass.....1912
BRICKENSTEIN, Miss MARY R., 1603 19th St., Washington, D. C....1920
BRIDGE, EDMUND, 52 Wyman St., West Medford, Mass.....1910
*BRIDGE, Mrs. EDMUND, 52 Wyman St., West Medford, Mass.....1902
BRIGHT, STANLEY, Eighth and Elm Sts., Reading, Pa.....1921
BRIMLEY, H. H., State Museum, Raleigh, N. C.....1904
BRISTOL, Miss F. L., 169 Columbia Heights, Brooklyn, N. Y.....1921
BROCKWAY, ARTHUR W., Hadlyme, Conn.....1912
BRONSON, BARNARD S., 175 Jay St., Albany, N. Y.....1920
BROOKING, A. M., Inland, Neb.....1920
BROOKS, Rev. EARLE AMOS, 10 Beacon St., Everett, Mass.....1892
BROOKS, GORHAM, 60 State St., Boston, Mass.....1919
BROWN, Miss ANNIE H., 31 Maple St., Stoneham, Mass.....1909
BROWN, Miss BERTHA L., 53 Court St., Bangor, Me.....1918
BROWN, C. EMERSON, Zool. Gardens, W. Philadelphia Pa.....1921
BROWN, EDMUND P., 48 Union St., Belfast, Me.....1920
BROWN, EDWARD J., 22 W. 47th Place, Los Angeles, Calif.....1891
BROWN, G. FRANKLIN, "Stonebridge," Needham, Mass.....1917
BROWN, HARRY A., 40 Talbot St., Lowell, Mass.....1912
BROWN, SAMUEL E., 10 Oakland St., Lexington, Mass.....1920
BROWN, WM. JAMES, 250 Oliver Ave., Westmount, Quebec.....1908
BROWNING, WM. HALL, 16 Cooper Square, New York, N. Y.....1911
BRUEN, FRANK, 29 High St., Bristol, Conn.....1908
BRUMBAUGH, CHALMERS S., 1020 Cathedral St., Baltimore, Md.....1916
*BRUUN, CHAS. A., 314 Reliance Bldg., Kansas City, Mo.....1919
BUGBEE, E. H., Williamstown, N. J.....1921
BULL, CHARLES L., Oradell, N. J.....1920
BULLOCK, D. S., c/o Amer. Embassy, Buenos Aires, Argentina..... 1920

BUNKER, CHARLES D., Kansas University Museum, Lawrence, Kan..1916
BURBANK, Mrs. DELANCEY G., 17 Cherry St., N. Adams, Mass..... 1920
BURGESS, HENRY C., M. D., Brighton Hall Canandaigua, N. Y..... 1920
BURGESS, JOHN KINGSBURY, Chestnut St., Dedham, Mass.....1898
BURGESS, THORNTON WALDO, 61 Washington R'd., Springfield, Mass1919
BURLEIGH, THOS. D., Div. Forestry, Univ. of Ga., Athens, Ga.....1913
BURNETT, WILLIAM L., State Agric. College, Fort Collins, Colo.....1895
BURNHAM, JOHN, 218 Timken Bldg., San Diego, Calif.....1920
BURNHAM, STEWART HENRY, Dept. Botany, College of Agriculture, Ithaca, N. Y.....1919
BURTCH, VERDI, Branchport, N. Y.....1903
BUTCHER, HOWARD JR., Ardmore, Pa.....1921
BUTLER, EDWARD, Baines, La.....1920
BUTLER, Miss VIRGINIA, Stockbridge, Mass.....1919
BUTTERWORTH, FRANK SEILER JR., Mt. Carmel, New Haven Co., Conn.....1918
BUTTS, HARRY W., Youngstown, N. Y.....1920
BYRD, Mrs. HIRAM, University, Ala.....1918
CADUC, EUGENE E., 539 Massachusetts Ave., Boston, Mass.....1910
CADY, Prof. WALTER GUYTON, 49 High St., Middletown, Conn.....1916
CAHN, ALVIN R., College Station, Texas.....1917
CALDWELL, GUY C., 63 Oxford St., Cambridge, Mass.....1920
CALHOUN, Miss EMMA MAY, 216 E. Front St., Monroe, Mich.....1921
CALLENDER, JAMES PHILIPS, 45 Wall St., New York, N. Y.....1903
CALVERT, EARL W., c/o. J. W. Noble, Harrow, Ont., Canada..... 1919
CAMBURN, Mrs. OSMAN M., 6 Oak Knoll, Arlington 74, Mass.....1920
CAMPINI, CHAS. A., 154 E. 33rd St., New York, N. Y.....1919
CANNON, GABRIEL, Spartanburg, S. C.....1920
CARLISLE, GEORGE L., Jr., 550 Park Ave., New York, N. Y..... 1920
CARPENTER, Rev. C. K., 1724 Sunnyside Ave., Chicago, Ill.....1894
CARPENTER, GEORGE I., 129 Dean St., Brooklyn, N. Y.....1907
CARRIGER, H. W., 5185 Trask St., Fruitvale Station, Oakland, Calif..1913
CARRYL, FRANK M., 1 Princeton St., Nutley, N. J.....1919
CARTER, C. M., 702 N. 6th St., St. Joseph, Mo.....1920
CARTER, JOHN D., Lansdowne, Pa.....1907
CARTER, T. DONALD, Am. Mus. Nat. Hist., New York, N. Y.....1921
CARTWRIGHT, W. J., 15 Latham St., Williamstown, Mass.....1920
CASE, Mrs. GEO. B., Englewood, N. J.....1920
CASH, HARRY A., 420 Hope St., Providence, R. I.....1898
CASWELL, Mrs. ARTHUR E., 241 Union St., Athol, Mass.....1918
CHAMBERLAIN, CHAUNCY W., 36 Lincoln St., Boston Mass.....1885
CHAPIN, Miss ANGIE C., 50 Saratoga Ave., Yonkers, N. Y.....1896
CHAPMAN, Mrs. F. M., Englewood, N. J.....1908
CHASE, RICHARD MORTON, 164 Westminister R'd, Rochester, N. Y..1919

CHASE, SIDNEY, 25 Ames Bldg., Boston, Mass.....1904
CHEESMAN, WM. H., Biological Survey, Washington, D. C.....1920
CHILDS, HENRY EVERETT, 864 Broadway, E. Providence, R. I.....1919
CHRISTIE, EDW. H., 5069 Kensington Ave., St. Louis, Mo.....1920
CHRISTOFFERSON, DR. KARL, Sault Ste. Marie, Mich.....1921
CHRISTY, R. T., Windsor, Nova Scotia.....1921
CLARK, ARTHUR L., Forest Home, Rt. 2, Ithaca, N. Y..... 1920
CLARK, AUSTIN HOBART, 1818 Wyoming Ave., Washington, D. C... 1919
CLARK, CLARENCE H., Lubec, Me.....1913
CLARK, Miss EMILY L., Box 3, St. Johnsbury, Vt.....1920
CLARK, JOSEPH P., M. D., 70 Marlborough St., Boston, Mass.....1920
CLARK, JOSIAH H., 702 E. 23rd St., Paterson, N. J.....1895
CLARKE, CHARLES E., 51 Summit R'd., Medford, Mass.....1907
CLARKE, Miss HARRIET E., 9 Chestnut St., Worcester, Mass.....1896
CLARKE, Miss MARY S., Chadwell, Va.....1916
CLARKE, Miss ROWENA A., Kirkwood, Mo.....1919
CLARKE, STANLEY F., 41 Taconic St., Pittsfield, Mass.....1920
CLEAVES, HOWARD H., Nat. Hist. Mus., Balboa Park, San Diego, Calif.....1907
CLEVELAND, Dr. CLEMENT, Box 211, W. Palm Beach, Fla.....1903
COALE, HENRY K., 528 S. Lincoln Ave., Highland Park, Ill.....1883
COBB, Miss ANNIE W., 58 Paul Revere Road, Arlington, Mass.....1909
COBB, PHILIP HACKER, Loomis Inst., Windsor, Conn.....1917
COBB, Dr. STANLEY, Ponkapog, Mass.....1909
COBURN, Mrs. LEWIS D., East Montpelier, Vt.....1921
CODMAN, JAMES M., 87 Milk St., Boston, Mass.....1920
COFFIN, Mrs. PERCIVAL B., 5714 Blackstone St., Chicago, Ill.....1905
COFFIN, ROBERT L., Mass. Agric'l. Exp. Sta., Amherst, Mass.....1917
COFFIN, Mrs. T. H., 1528 Jefferson Ave., Scranton, Pa.....1921
COGGINS, HERBERT L., 2929 Piedmont Ave., Berkeley, Calif.....1913
COLBURN, ALBERT E., 806 S. Broadway, Los Angeles, Calif.....1891
COLE, JOHN L., Rt. 5, Nevada, Iowa.....1920
COLE, Dr. LEON J., College of Agric., Univ. of Wis., Madison, Wis.. 1908
COLLINS, ALFRED M., 226 Columbia Ave., Philadelphia, Pa..... 1921
COMMONS, Mrs. F. W., 608 Cham'r of Commerce, Minneapolis, Minn 1902
CONGER, ALLEN C., 527 Forest St., E. Lansing, Mich.....1919
CONOVER, HENRY B., 6 Scott, St., Chicago, Ill.....1920
CONROE, IRWIN A. Alfred University, Alfred, N. Y..... 1921
COOK, CECIL DURWARD, 64 Flatt Ave., Hamilton, Ont.....1921
COOK, FRANKLIN P., Seaside Hotel, Atlantic City, N. J.....1920
COOK, FREDERICK, W., 1604 East Harrison St., Seattle, Wash.....1915
*COOKE, Miss MAY THACHER, 1328 Twelfth St., Washington, D. C..1915
COOKMAN, ALFRED, 2929 B. St., San Diego, Calif.....1920
COOLIDGE, PHILIP T., 31 Central St., Bangor, Me.....1919

COPE, FRANCIS R., Jr., Dimock, Pa..... 1897
COPELAND, Miss ADA B., 1103 White Ave., Grand Junction, Colo....1912
COPELAND, MANTON, 88 Federal St., Brunswick, Me.....1900
CORDIER, Dr. A. H., 415 Benton Blv'd., Kansas City, Mo.....1920
CORRINGTON, J. D., Dept. Biology Univ. S. C., Columbia, S. C..... 1921
CORYELL, SHERMAN, 1500 Hood Ave, Chicago, Ill.....1921
COUES, Dr. WM. P., 31 Massachusetts Ave., Boston, Mass.....1920
COULTAS, WILLIAM F., 156 Quadrangle Bldg. Iowa City, Ia.....1921
COURT, EDWARD J., 1723 Newton St., N. W, Washington, D. C.... 1919
COVELL, Dr. HENRY H., 1600 East Ave., Rochester, N. Y.....1918
COX, RODMAN DAYTION, 56 College Ave., Rochester, N. Y.....1919
CRABBE, Mrs. MARY E., 80 Oak St., Far Rockaway, N. Y..... 1921
CRAIG, WALLACE, Univ. of Maine, Orono, Me.....1912
CRANE, Miss CLARA L., Dalton, Mass.....1904
CRANE, Mrs. ZENAS, Dalton, Mass.....1904
CRIDDLE, NORMAN, Treesbank, Man.....1918
CROCKER, WM. T., 263 Lexington Ave., New York, N. Y.....1920
*CROSBY, MAUNSELL S., Rhinebeck N. Y.....1904
CROSS, ALBERT ASHLEY, Huntington, Mass.....1918
CROSS, Mrs. R. J., 210 Mercer St., Princeton, N. J.....1921
CROSSMAN, ANNIE F., Mus. Nat. Hist., Pittsfield, Mass.....1920
CROWELL, Miss J. OLIVIA, Dennis, Mass.....1918
CUDWORTH, WARREN H., 15 Beacon Ave., Norwood, Mass.....1919
CUMMINGS, Miss EMMA G., 16 Kennard Road, Brookline, Mass.....1903
CUNNINGHAM, J. WALTER, 3009 Dunham Ave., Kansas City, Mo....1919
CURRIER, EDMONDE SAMUEL, 416 E. Chicago St., Portland, Ore.....1894
CURRIE, ROLLO P., 632 Keefer Pl., Washington, D. C.....1895
CURRY, HASKELL BROOKS, 60 Bay State Road, Boston, 17, Mass....1916
CURTIS, CHARLES P., 244 Beacon St., Boston, Mass.....1915
CURTIS, ROY Q., JR., 11 W. 76th St., New York, N. Y.....1919
CUTTER, Miss LUCIA B., Jaffrey, N. H.....1920
DADISMAN, A. J., 115 Beverly Ave., Morgantown, W. Va.....1921
DALEY, Miss MARY WOOD, Sleighton Farm, Darling P. O., Delaware Co., Pa.....1920
DANE, Mrs. ERNEST B., Chestnut Hill, Mass.....1912
DANFORTH, STUART T., College of Agr., Mayaguez, P. R.....1916
DANIELS, EDWARD S., 7th and Elm Sts., St. Louis, Mo.....1919
DAVENPORT, Mrs. ELIZABETH B., Brattleboro, Vt.....1898
DAVIDSON, Mrs. FRANCES S., 1917 Emerson Ave., S., Minneapolis, Minn.....1921
DAVIES, Miss DOROTHY E., Blackinton, Mass.....1920
DAVIS, Miss Bertha E., 22 Cypress Place, Brookline, 46, Mass.....1920
DAVIS, JOHN M., 737 M. St., Eureka, Calif.....1920
DAVIS, R. N., Everhart Museum, Scranton, Pa.....1920
DAWSON, Prof. RALPH W., 1105 N. 33rd St., Lincoln, Neb.....1920

DAY, CHESTER SESSIONS, 16 Browne St., Brookline 47, Mass.....1897
DEAN, F. ROY, 3465 S. Spring Ave., St. Louis, Mo.....1919
DEAN, R. H., 720 Quintard Ave., Anniston, Ala.....1913
DEANE, GEORGE CLEMENT, 80 Sparks St., Cambridge, Mass.....1899
DEARBORN, SAMUEL S., 411 Marlborough St., Boston, Mass.....1919
DELOACH, R. J. H., 10145 Longwood Drive, Chicago, Ill.....1910
DELURY, Dr. RALPH E., Dominion Observatory, Ottawa, Canada...1920
DEVANY, J. L., Annapolis Royal, Nova Scotia 1921
DENNIS, Dr. LABAN, 71 Ridge Ave., Orange, N. J.....1921
DENSMORE, Miss MABEL, 910 4th St., Red Wing, Minn.....1910
DERBY, Dr. RICHARD, Oyster Bay, L. I., N. Y.....1898
DERY, Dr. D. A., 112 Rue St. Joseph, Quebec, Canada.....1921
DEWEY, Dr. CHARLES A., 78 Plymouth Ave., Rochester, N. Y..... 1900
DEWIS, Dr. JOHN W., 69 Newberry St., Boston 17, Mass.....1920
DEXTER, Prof. JOHN SMITH, Univ. Sask. Saskatoon, Sask.....1919
DEXTER, LEWIS, 1889 Elm St., Manchester, N. H.....1915
DEXTER, Rev. SMITH OWEN, Concord, Mass.....1920
DICE, LEE RAYMOND, Mus. Zool., Ann Arbor, Mich.....1918
DICKENS, Miss ELIZABETH, Block Island, R. I.....1921
DICKEY, DONALD R., San Rafael Heights, Pasadena, Calif.....1907
DILLE, FREDERICK M., Niobrara Reservation, Valentine, Neb.....1892
DINGLE, EDWARD VON S., Summerton, S. C.....1920
DINGS, G. MCCLELLAND, 2161 Railway Exch. Bldg., St. Louis, Mo..1919
DIONNE, C. E., Laval University, Quebec, Canada.....1893
DIXON, FREDERICK J., 111 Elm Ave., Hackensack, N. J.....1891
DIXON, JOSEPH S., Univ. of Calif., Berkeley, Calif.....1917
DONAHUE, RALPH J., 228 N. Emerson Ave., Bonner Springs, Kan... 1919
DOOLITTLE, E. A., Box 44, Painesville, Ohio.....1921
DRAPER, Miss SARAH L., Saxton's River, Vermont.....1921
DRAPER, WALLACE S., Wayland, Mass.....1920
DRIER, THEODORE, 35 Remsen St., Brooklyn, N. Y.....1919
DRUMMOND, Miss MARY, 510 Spring Lane, Lake Forest, Ill.....1904
DUANE, ARTHUR, "Cool Gales," Sharon, Conn.....1920
DUBOIS, ALEXANDER D., 327 S. Glenwood Ave., Springfield, Ill.....1918
DUER, HARRY ELDON, 519 Schofield Bldg., Cleveland, Ohio..... 1921
DULL, Mrs. A. P., L. 211 N. Front St., Harrisburg, Pa.....1900
DUNBAR, Miss LULA, R. D. 1, Elkhorn, Wis.....1918
DUNN, Mrs. H. A., Rt. 3, Box 63, Athol, Mass.....1920
DURFEE, OWEN, 727 Madison St., Fall River, Mass.....1887
DYE, HAROLD G., 202 Parsells Ave., Rochester, N. Y.....1921
DYKE, ARTHUR CURTIS, 205 Summer St., Bridgewater, Mass.....1902
EADIE, GUY L., Berwyn, Pa.....1920
EARL, D. OSBOURNE, 17 Bates St., Cambridge, Mass.....1919
EARL, THOMAS M., 258 Lexington Ave., Columbus, Ohio.....1921
EASTMAN, Major FRANCIS B., Camp Grant, Ill.....1909

EASTMAN, Miss SARAH C., 51 Chapel St., Portland, Me.....1920
*EATON, HOWARD, Wolf, Sheridan Co., Wyo.....1918
EATON, Miss MARY S., 8 Monument St., Concord, Mass.....1909
EATON, SCOTT HARRISON, Box 653, Lawrenceville, Ill.....1912
EATON, WARREN FRANCIS, 17 Weld Hall, Cambridge, Mass.....1921
EDSON, JOHN M., Marietta Road, Bellingham, Wash.....1886
EDSON, WM. L. G., 54 Fairview Ave., Rochester, N. Y.....1916
EHINGER, Dr. CLYDE E., 728 Franklin St., Keokuk, Iowa.....1904
EIFRIG. Prof. C. W. GUSTAVE, 504 Monroe Ave., Oak Park, Ill.....1901
EIMBECK, Dr. AUGUST F., New Haven, Mo.....1906
EKBLAW, WALTER ELMER, 711 W. Nevada St., Urbana, Ill.....1911
ELIOT, WILLARD AYRES, 1011 Thurman St., Portland, Ore.....1918
ELLIOT, Mrs. JANE SHIELDS 2900 Q. St., N. W., Washington. D. C...1921
ELLIOT, Miss SARAH J., Union Hospital, Terre Haute, Ind.....1920
ELLS, GEORGE P., Norwalk, Conn.....1904
EMERSON, W. OTTO, Hayward, Calif.....1916
EMLEN, ARTHUR COPE, "Awbury," Germantown, Philadelphia, Pa..1921
ENGLISH, Mrs. T. F., 3631 Campbell St., Kansas City, Mo.....1919
ENO, HENRY LANE, Princeton, N. J.....1918
ERICHSEN, W. J., 2311 Barnard St., Savannah, Ga.....1919
ESLUCK, Miss AUGUSTINE W., 58 Highland Ave., Greenfield, Mass. 1920
ESTERLY, Dr. CALVIN O., Occidental College, Los Angeles, Calif.....1921
EVANS, Dr. EVAN M., 550 Park Ave., New York, N. Y.....1916
EVANS, FRANK C., Crawfordsville, Ind.....1919
EVANS, WILLIAM B., Moorestown, N. J.....1897
EVANS, WILLIAM V., 410 East Geyser St., Livingston, Mont.....1921
EYER, GEO. A., Short Hills, N. J.....1918
FAIRMAN, Miss MARIAN, 4744 Kenwood Ave., Chicago, Ill.....1920
FALGER, Mrs. WM., 224 Magnolia Ave., Modesto, Calif.....1918
FARLEY, FRANK L., Camrose, Alberta.....1920
FAXON, ALLAN HART, 7 Edwards St., Southbridge, Mass.....1916
FAY, S. PRESCOTT, 53 State St., Boston, Mass.....1907
FELGER, ALVA HOWARD, North Side High School, Denver, Colo.....1898
FELL, Miss EMMA TREGO, Holicong, Bucks Co., Pa.....1903
FERGUSON, ALFRED L., 11 Thomas St., New York, N. Y.....1920
FERGUSON, HARRY L., 11 Thomas St., New York, N. Y.....1920
FERRES, Mrs. WALTER D., 78 Sunset Ave., Ridgewood, N. J.....1921
FIELD, Dr. GEORGE W., 2807 18th St., N. W., Washington, D. C...1910
FIELD, WM. L. W., Milton Acad., Milton, Mass.....1920
FISHER, Miss ELIZABETH WILSON, 2222 Spruce St., Philadelphia, Pa.1896
FISHER, Dr. G. CLYDE, American Mus. Nat. Hist., New York, N. Y 1908
FITZPATRICK, WM. J., c/o. Brown, Durrell Co., 104 Kingston St., Boston, Mass.....1920
FLEISHER, EDWARD, 1068 Park Place, Brooklyn, N. Y.....1916
FLETCHER, L. B., 54 Cotswold Rd., Brookline, Mass.....1921

FLETCHER, LYLE, Norton, Kan.....1919
FLETCHER, Mrs. MARY E., Proctorville, Vt.....1898
FLOYD, CHARLES BENTON, 382 Wolcott St., Auburndale, Mass..... 1916
FLOYD, J. L., 508 New Harter Bank Bldg. Canton, Ohio..... 1921
FOLSOM, Miss IDA M., Normal School, Presque Isle, Me.....1920
FOOT, Dr. NATHAN CHANDLER, Readville, Mass.....1916
FORAN, PHILIP FULFORD, 147 Wilbrod St., Ottawa, Ontario, Can.... 1921
FORBES, RALPH E., 328 Adams St., Milton, Mass.....1917
FORD, EDWARD R., 126 Madison Ave., S. E., Grand Rapids, Mich...1920
FORD, Miss LOUISE PETIGRU, "The Heights," Aiken, S. C.....1919
FORTNER, Prof. HARRY C., Univ. Tennessee, Knoxville, Tenn.....1920
*FOSTER, FRANCIS A., Edgartown, Mass.....1918
FOSTER, FRANK B., Haverford, Pa.....1916
FOSTER, Dr. G. S., 967 Elm St., Manchester, N. H.....1921
FOTHERGILL, Miss E. R., 208 S. Whitney St., Hartford, Conn.....1920
FOWLER, FREDERICK HALL, 221 Kingsley Ave., Palo Alto, Calif.....1892
FOWLER, HENRY W., Acad. Nat. Sciences, Philadelphia, Pa.....1898
FRASER, DONALD, Johnstown, N. Y.....1902
FREAS, ELLA M., 845 W. State St., Trenton, N. J.....1921
FREEMAN, Dr. C. D., Box 113, Medina, Ohio.....1920
FREEMAN, Prof. DANIEL, 711 7th St., S. Fargo, N. D.....1920
FREEMAN, Miss HARRIET E., 37 Union Park, Boston, Mass.....1903
FRENCH, Mrs. A. J., R. F. D. 1, Carlton, Oregon.....1921
FRENCH, CHARLES H., Canton, Mass.....1904
FRENCH, Mrs. CHAS. H., Canton, Mass.....1908
FRIEDMANN, HERBERT, Graduate School, Cornell Univ., Ithaca, N. Y.1921
FRIEDMAN, RALPH, 32 Garden Place, Brooklyn, N. Y..... 1921
FROST, ALLEN, c/o. Trussell Mfg. Co., Poughkeepsie, N. Y..... 1919
FRY, HENRY J., 88, 27th St., Elmhurst, L. I., N. Y.....1916
*FUGUET, HOWARD, 560 Bullitt Bldg., Philadelphia, Pa.....1919
FULLER, HENRY C., 1348 Euclid St., Washington, D. C.....1916
FULLER, Mrs. T. OTIS, Needham, Mass.....1909
FUNKE, HERBERT F. L., 116 Broad St., New York, N. Y.....1921
GAGE, ARTHUR, Camp Douglas, Rt. 2, Box 36, Wisconsin.....1920
GALVIN, E. R., 5056 DuPont Bldg., Wilmington, Del 1921
GANIER, ALBERT F., 2507 Ashwood Ave., Nashville, Tenn.....1917
GARDINER, CHARLES BARNES, 175 W. Main St., Norwalk, Ohio..... 1903
GARDNER, ASTON COLEBROOK, "Little Tangley", Ember Lane, Esher, Surrey, England.....1919
GARDNER, Mrs. E. P., 140 Gibson St., Canandaigua, N. Y.....1920
GARDNER, Mrs, W. H., Bucksport, Me.....1920
GARST, Dr. JULIUS, 29 Oread St., Worcester, Mass.....1916
GAUDETTE, Miss MARIE E., Park Museum, Providence R. I.....1921
GERTH, WALTER G., 3929 Greenview Ave, Chicago, Ill.....1918

GERTKEN, Prof. SEVERIN, St. John's University, Collegeville, Minn...1912
GIANINI, CHAS. A., Poland, N. Y.....1911
GIBSON, LANGDON, Box 794, Clearwater, Fla.....1887
GIFFORD, PAUL C., 73 Whittier Ave., Olneyville, R. I.....1921
GIGNOUX, CLAUDE, 73 Tunnel Road, Berkeley, Calif.....1921
GILBERT, Mrs. F. M., Walpole, N. H.....1919
GILCHRIST, Mrs. D. A., 1519 W. Washington St., Phoenix, Ariz..... 1920
GILES, ROSCOE I., 82 Newton St., Marlborough, Mass.....1921
GILLIAM, ROBERT A., 810 Southwestern Life Bldg., Dallas, Texas... 1920
GILLIN, JAMES R., Ambler, Pa.....1921
GILMAN, M. FRENCH, Banning, Calif.....1907
GLADDING, Mrs. JOHN R., 30 Stimson Ave., Providence, R. I.....1912
GLASSFORD, S. ROBERT, 63 Highland Ave., Ridgewood, N. J.....1921
GLEASON, Mrs. C. H., 700 Madison Ave., S. E., Grand Rapids, Mich1917
GLOYD, HOWARD K., Wellsville, Kan..... 1920
GORLITZ, WALTER A., 170 Nunda Boulevard, Rochester, N. Y.....1916
GOLSAN, LEWIS S., Box 97, Prattville, Ala.....1912
GOODE, Mrs. F. B., Sharon, Mass.....1918
GOODRICH, Miss JULIET T., State Line, Vilas County, Wis.....1904
GORDON, HARRY E., 307 Laburnum Cres., Rochester, N. Y.....1911
GORE, JOHN K., 69 High St., Orange, N. J.....1921
GORMLEY, A. LIGNORI, Box 80, Arnprior, Ont.....1918
GORST, CHARLES C., 28 Beauford R'd., Jamaica Plain, Boston, Mass. 1916
GOULD, JOSEPH E., Box 65, Barbourville, Ky.....1889
GOWANS, Miss EDITH, Kent, Normal College, Kent, Ohio.....1921
GOWANLOCK, J. NELSON, Dept. Zool. Univ. Chicago, Ill.....1919
GOWDY, EARL R., 60 Washington St., Leominster, Mass.....1920
GRANGE, WALLACE B., Ladysmith, Wis.....1920
GRANGER, WALTER W., Amer. Mus. Nat. Hist., New York, N. Y... 1891
GRANT, Mrs ADELE L., Dept. Botany, Cornell Univ., Ithaca, N. Y. 1919
GRANT, WM. W., 600 Castle St., Geneva, N. Y.....1910
GRAVES, Miss BESSIE M., Box 80, Bethel, Vt.....1920
GRAVES, Mrs. CHARLES B., 4 Mercer St., New London, Conn..... 1905
GRAY, GEORGE W., Greenvale, Poughkeepsie, N Y.....1920
GRAY, GEORGE M., Box 89, Woods Hole, Mass.....1916
GREEN, HORACE OAKES, 114 North Ave., Wakefield, Mass.....1917
GREEN, Miss. FLORENCE L., 29 Laurel St., Concord, N. H.....1921
*GREEN, MORRIS MILLER, 39 Wyoming Ave., Ardmore, Pa.....1921
GREENE, EARLE R., 108 Orme Circle, Atlanta, Ga.....1921
GREENLAW, JOS. M., 28 Budleigh St., Beverly, Mass.....1920
GREENOUGH, HENRY VOSE, 39 Worthington Road, Brookline, Mass..1901
GREGORY, STEPHEN S., JR., 456 Surf St., Chicago, Ill.....1916
GRIFFEE, WILLET E., Route 3, Corvallis, Ore.....1919
GRIFFIN, BERTRAM S., 22 Currier Ave., Haverhill, Mass.....1917

GRIM, WILLIAM H., Hamburg, Pa.....1921
GROSS, DR. ALFRED O., Bowdoin College, Brunswick, Me.....1907
GROSVENOR, Miss LULU E., 304 Mass. Ave., Washington, D. C..... 1920
GUNTHORP, Prof. HORACE, 2107 E. 55th St., Univ. of Wash., Seattle, Wash.....1919
HABERYAN, H. D, Box 32, Farmerville, La.....1921
HADLEY, ALDEN H., Monrovia, Ind.....1906
HADLEY, FRED N., 1305 Roberts Ave., Whiting, Ind..... 1921
HADELER, E. W., 520 So. State St., Painesville, Lake Co., Ohio..... 1920
HAGAR, J. A., Marshfield Hills, Mass.....1914
HAILE, H. PENNINGTON, 28 Edwards St., Springfield, Mass.....1919
HALE, CHARLOTTE T., 11 Loomis St., Burlington, Vt..... 1921
HALLINAN, THOMAS, 212 Madison Ave., Paterson, N. J.....1919
HALLINEN, JOSEPH E., Cooperton, Okla.....1919
HAMILTON, Dr. BAKER A., Highland Park, Ill.....1920
HANDLEY, CHAS. O., Box 195, Lexington, Va.....1916
HANKINSON, THOS. L., State Normal College, Ypsilanti, Mich.....1897
HANNA, G. DALLAS, California Acad. Sci., San Francisco, Calif.....1919
HANNA, WILSON CREAL, 1000 Pennsylvania Ave., Colton, Calif.....1919
HANNUM, WILLIAM E., Primos, Delaware Co., Pa..... 1920
HARDON, Mrs. HENRY W., Wilton, Conn.....1905
HARING, Mrs. INEZ M., 1774 Delmont Ave., East Cleveland, Ohio.. 1921
HARKIN, Hon. JAMES B., Commissioner Canadian Nat. Parks, Ottawa, Canada.....1921
HARPER, SAMUEL A., 230 N. Keystone Ave., River Forest, Ill.....1920
HARRINGTON, Mrs. A. B., Lincoln, Mass.....1919
HARRINGTON, RALPH M., 595 Ashland Ave., Buffalo, N. Y.....1915
*HARRISON, GEO. L., Jr., 400 Chestnut St., Philadelphia, Pa..... 1919
HARRISON, HARRY MORGAN, 319 Penn St., Camden N. J.....1919
HART, CECIL, Rt. 6, Box 432, Los Angeles, Calif.....1921
HART, Miss HELEN, Williamstown, Mass.....1920
HARTLEY, GEO. INNESS, 344 W. 87th St., New York, N. Y.....1919
HARTSHORN, HAROLD IRA, 53 S. 12th St., Newark, N. J.....1918
HARVEY, JOHN L., 3 Moody St., Waltham, Mass.....1916
HASBROUCK, HENRY C., 929 West End Ave., New York, N. Y.....1920
HASKELL, Miss SADIA, 1236 11th St., N. W., Washington, D. C.....1916
HASTINGS, WALTER E., Box 1, South Lyon, Mich.....1921
HATHAWAY, ALTON HASTINGS, 25 Oakland St., Lexington, Mass.....1921
HATHAWAY, Mrs. E. L., Spring St., R. D. 1, W. Bridgewater, Mass.....1920
HATHAWAY, HARRY S., Box 1466, Providence, R. I.....1897
HAVEMEYER, H. O., Mahwah, N. J.....1893
HAVEMEYER, H. O., Jr., Mahwah, N. J.....1919
HAVEN, HERBERT, M. W., 500 Forest Ave., Portland, Me 1920
HAWES, Dr. EDWARD E., Hyannis, Mass.....1920
HAWK, JOHN L., 5843 Plymouth Ave., St. Louis, Mo.....1920

HEALEY, ALDEN P., 2006 Northampton St., Holyoke, Mass.....1919
HEALY, DR. DANIEL J., Experiment Sta., Lexington, Ky.....1921
HEATH, Miss CHARLOTTE M., Box 76, Easton, Mass.....1920
HEDGES, CHAS. F., 1505 Pearl St., Miles City, Mont.....1919
*HELME, ARTHUR H., Miller Place, N. Y.....1888
HEMENWAY, AUGUSTUS, Tavern Club, Bolyston Pl., Boston, Mass...1920
HEMPEL, Miss KATHLEEN, Elkader, Iowa.....1919
HEMPHILL, ASHTON ERASTUS, Holyoke, Mass.....1919
HENDERSON, HARLIN C., Carpinteria, Santa Barbara Co., Calif.....1920
*HENDERSON, J. B., 16th St., & Florida Ave., N. W., Washington, D. C.1918
HENDERSON, Judge JUNIUS, 627 Pine St., Boulder, Colo.....1903
HENDERSON, WALTER C., 4727 13th St., N. W., Washington, D. C.. 1917
HENDRICKSON, W. F., 276 Hillside Ave., Jamaica, N. Y.....1885
HERMAN, Dr. WILLIAM C., 19 West 7th St., Cincinnati, Ohio.....1921
HERMAN, THEODORE L., 273 Neal Dow Ave., New Brighton, N. Y. 1916
*HERRICK, HAROLD, 123 William St., New York, N. Y.....1905
HERRICK, NEWBOLD L., 60 Wall St., New York, N. Y.....1913
HERRICK, N. LAWRENCE, Cedarhurst, N. Y.....1917
HILL, JAMES HAYNES, 108 State St., New London, Conn.....1897
HILL, Mrs THOMAS R., Box 491, Chatauqua, N. Y.....1903
HIMMAL, WALTER J., Old Science Bldg. Dept. Botany, Iowa City, Iowa.....1920
HINCKLEY, GEO. LYMAN, Redwood Library, Newport, R. I.....1912
HINE, Prof. JAMES STEWART, Ohio State Univ., Columbus, Ohio....1899
HITCHCOCK, FRANK H., 120 Broadway, New York, N. Y.....1921
HIX, GEORGE E., 100 W. 91st St., New York, N. Y.....1904
HOLLAND, HAROLD MAY, Galesburg, Ill.....1910
HOLLAND, R. P., 2273 Woolworth Bldg. New York, N. Y.....1920
HOLLAND, Dr. WILLIAM J., Carnegie Museum, Pittsburgh, Pa.....1899
HOLLISTER, G. B., 4 E. 5th St., Corning, N. Y.....1919
HOLLISTER, WARREN D., Delavan, Wisc.....1901
HOLMAN, RALPH H., 25 Livermore Rd., Wellesley Hills, Mass.....1907
HOLT, ERNEST G., c/o Amer. Embassy, Rio de Janeiro, Brazil.....1911
HONYWILL, ALBERT W., JR., 211 Ridgefield St., Hartford, Conn.....1907
HORSFALL, ROBERT BRUCE, 1457 E. 18th. St., Portland, Ore.....1905
HORSEY, RICHARD E., Highland P'k,. Reservoir Ave., Rochester, N. Y.....1919
HOTCHKISS, NEIL, R't. 2, Marcellus, N. Y.....1919
HOUGHTON, CLARENCE 533 Washington Ave., Albany, N. Y.....1920
HOWE, CLIFTON D., Univ. of Toronto, Toronto, Ontario.....1921
HOWE, Mrs. E. L., Princeton, N. J.....1921
HOWE, INEZ ADDIE, Fairbank Mus. Nat. Sci., St. Johnsbury Vt.....1921
HOWLAND, R. H., 164 Wildwood Ave., Upper Montclair, N. J.....1903
HOYT, WILLIAM H., Box 425, Stamford, Conn.....1907
HUBBARD, C. ANDRESEN, 287 E. 44th St., Portland, Ore.....1916

HUBBARD, Prof. MARIAN E., 15 Appleby Road, Wellesley, Mass.....1916
HUBBARD, RALPH, 1038 University Ave., Boulder, Colo.....1916
HUBER, WHARTON, 225 St. Marks Sq., Philadelphia, Pa.....1915
HUEY, L. M., Nat. Hist. Mus., Balboa Park, San Diego, Calif.....1920
HUGHES, GEO. T., Box 153, Plainfield, N. J.....1919
HUGHES, Dr. WILLIAM E., 3945 Chestnut St., Philadelphia, Pa.....1920
HULL, Mrs. BAKER, The Washington Apts., Baltimore, Md.....1921
HUNN, JOHN T. SHARPLESS, 1218 Prospect Ave., Plainfield, N. J.... 1895
HUNT, CHRESWELL JOHN, 5847 W. Superior St., Chicago, Ill.....1919
HUNT, Miss LUCY O., 185 Beacon St., Hartford, Conn.....1919
HUNT, RICHARD M., Mus. Vert. Zool., Berkeley, Calif.....1918
HURD, Miss FRANCES A., 43 West Ave., S. Norwalk, Conn.....1919
HUSHER, Mrs. GERTRUDE H., 821 S. Hope St., Los Angeles, Calif... 1918
HYDE, Mrs. S. E., Regina, Idaho.....1918
HYDE, SIDNEY, 1534 Boswell Ave., Topeka, Kansas.....1921
HYSLOP, SAMUEL, 42 Bellevue St., Newton, Mass.....1919
INGERSOLL, ALBERT M., 908 F St., San Diego, Calif.....1885
ISHAM, CHAS. B., 50 W. 67th St., New York, N. Y.....1891
JACKSON, Dr. HARTLEY H. T., Biological Survey, Washington, D. C. 1910
JACKSON, JOHN W., Belchertown, Mass.....1920
JACKSON, RALPH W., R. D. 1, Cambridge, Md.....1918
JAMES, NORMAN, Catonsville, Md.....1913
JAMES, THOMAS A., Augusta, Me.....1920
JANVRIN, Dr. E. R. P., 515 Park Ave., New York, N. Y.....1919
JAY, WILLIAM, 6662 Germantown Ave., Mt. Airy, Philadelphia, Pa..1921
JENKS, CHAS. W., Bedford, Mass.....1912
JENNEY, Hon. CHARLES F., 100 Gordon Ave., Hyde Park, Mass.....1905
JENNINGS, Dr. GEO. H., Jewett City, Conn.....1918
JENNINGS, RICHARD D., 129 Harrison St., East Orange N. J.....1913
JENSEN, J. K., U. S. Indian School, Santa Fe, N. Mex.....1912
JEWETT, STANLEY G., 582 Bidwell St., Portland, Ore.....1906
JOHNSON, Prof. CHAS. E., Dept. Zool., Kan. Univ., Lawrence, Kan..1919
JOHNSON, FRANK E., 16 Amackassin Terrace, Yonkers, N. Y.....1888
JOHNSON, Mrs. GRACE P., Museum Nat. Hist., Springfield, Mass.... 1921
JOHNSON, REGINALD M., 60 State St., Boston, Mass.....1920
JOHNSON, WARD L., Lawrence School, Hewlett, Long Island, N. Y...1920
JOHNSTONE, WALTER B., Edgewood, Arrow Lake, B. C.....1920
JONES, JESSE L., 198 Dewey St., Edgewood, Pittsburgh, Pa.....1921
JONES, Dr. LOMBARD CARTER, Falmouth, Mass.....1917
JONES, S. PAUL, 204 Frame Ave., Waukesha, Wis.....1920
JONES, WILLIAM F., Norway, Me.....1918
JONES, STERLING P., 690 Bonita Ave., Webster Groves, Mo.....1921
JORDAN, A. H. B., Everett, Wash.....1888
JOY, ERNEST, Grand Menan, N. B.....1921
JUMP, Mrs. EDWIN R., 97 Oakleigh Road, Newton, Mass.....1910
JUNG, CLARENCE S., 553 Prospect Ave., Milwaukee, Wis.....1921

KAEDING, GEO. L., Cortez, Lander Co., Nev.....1918
KANE, Mrs. SUSAN MARY, Mich. Club Bldg., Seattle, Wash.....1919
KEAYS, JAMES EDWARD, 328 St. George St., London, Ontario, Canada. 1921
KEE, HUNTER, Marlinton, W. Va.....1920
KEIL, ELLA ANNA, Box 45, N. Tonawanda, N. Y.....1921
KELLOGG, RALPH T., Silver City, N. M.....1913
KELSO, Dr. JOHN E. H., Edgewood, Lower Arrow Lake, B. C.....1915
KENNEDY, EDWARD H., South Easton, Mass.....1920
KENNEDY, Dr. HARRIS, Readville, Mas.....1916
*KENNEDY, HARRY H., 105 Vine St., Reno, Nev.....1920
KENT, DUANE E., 39 Morse Place, Rutland, Vt.....1913
KENT, EDWARD G., 9 Highland Ave., Madison, N. J.....1919
KENT, EDWIN C., 19 Liberty St., New York, N. Y.....1907
KESSEL, MARCEL H., 695 Auburn Ave., Buffalo, N. Y.....1920
*KIDDER, NATHANIEL T., Milton, Mass.....1906
KILGORE, WILLIAM, Jr., Zool. Mus, Univ. Minn., Minneapolis, Minn 1906
KING, F. M., 111 E. Cedar St., Webster Grove, Mo.....1921
KING, LEROY, 116 E. 22nd St., New York, N. Y.....1901
KINGSBURY, FREDERICK S., 97 Oliver St., Boston, Mass.....1916
KIRKHAM, Mrs. JAMES W., 275 Maple St., Springfield, Mass.....1904
*KIRKHAM, STANTON D., 152 Howell St., Canandaigua, N. Y.....1910
KIRKPATRICK, HARRY C., 1166 Water St.. Meadville, Pa.....1921
KIRKWOOD, FRANK C., R. F. D. 3, Monkton, Md.....1892
*KIRN, ALBERT J. B., R. F. D. 4, Solomon, Kan.....1918
KITTREDGE, JOSEPH, Jr., Forest Service, Washington, D. C. 1910
KLOSEMAN, Miss J. E., Beal Hall, 20 Charlesgate W., Boston, Mass. 1909
KNAEBEL, ERNEST, 3707 Morrison St., Chevy Chase, D. C.....1906
KNOLHOFF, FERDINAND WILLIAM, Amityville, N. Y.....1890
KOBBE, FREDERICK W., 103 E. 86th St., New York, N. Y.....1921
KOPMAN, HENRY H., Dept. Conservation, 207 N. O. Court Bldg., New Orleans, La.....1921
KREHBIEL, LEONARD, W. 10th St., Upland, Calif.....1920
KRETZMAN, Prof. P. E., 3705 Texas Ave., St. Louis, Mo.....1913
KUBICHEK, W. F., 926 Church St., Iowa City, Ia.....1919
KUSER, ANTHONY R., Bernardsville, N. J.....1908
KUSER, Mrs. ANTHONY R., Bernardsville, N. J.....1910
KUSER, JOHN DRYDEN, Bernardsville, N. J.....1910
LABARTHE, JULES, 2727 Russell St., Berkeley, Calif.....1920
LADD, HARRY STEPHEN, 4354 McPherson Ave., St. Louis, Mo.....1919
LADOW, STANLEY V., 25 Fifth Ave., New York, N. Y.....1919
LAFRANCHISE, Miss MARY L. Y., 31 Sherbrooke Ave., Hull, Quebec, Canada.....1921
LAING, HAMILTON M., 1277 E. 32nd St., Portland, Ore.....1917
LAIRE, Mrs. MARGARET P., 72 Rebecca Ave., Pleasantville, N. Y....1921
LAMB, CHAS. R., 8 Highland St., Cambridge, Mass.....1910
LANCASHIRE, Mrs. JAMES HENRY, 7 East 75th St., New York, N. Y. 1909

LANG, HERBERT, Amer. Mus. Nat. Hist., New York, N. Y.....1907
LANGDON, ROY M., 847 E. Colfax Ave., Denver, Colo.....1919
LANGILLE, JAMES H., Kensington, Md.....1921
LANO, ALBERT, Fayetteville, Ark.....1917
LARRABEE, Prof. AUSTIN P., Yankton College, Yankton, S. Dak.....1918
LASTRETO, C. B., 260 California St., San Francisco, Calif.....1919
LATHAM, ROY, Orient, N. Y.....1916
LAUGHLIN, Miss EMMA E., 127 Walnut St., Barnesville, Ohio.....1920
LAUGHLIN, J. A., 318 E. Gordon St., Marshall, Mo.....1919
LAURENT, PHILIP, 31 E. Mt. Airy Ave., Philadelphia. Pa.....1902
LAWRENCE, A. G., City Health Dept., Winnipeg, Man.....1920
LAWSON, RALPH, 88 Washington Sq. East, Salem, Mass.....1917
LEACH, FRANK A., 217 Hillside Ave., Piedmont, Calif.....1921
LEARNED, Miss AGNES M., Wilkins St., Hudson, Mass.....1920
LEAVITT, Mrs. FLORENCE R., 42 Forest St., Lexington, Mass.....1919
LEE, Mrs. L. W., El Cajon, San Diego Co., Calif.....1920
LEFFINGWELL, DANA J., Aurora, N. Y.....1919
LEISTER, CLAUDE W., McGraw Hall, Ithaca, N. Y.....1916
LENGERKE, JUSTUS VON 257 Highland Ave., Orange, N. J.....1907
LEONHARD, W. J., Shoreham, Vt.....1920
LEOPOLD, NATHAN F., JR., 4754 Greenwood Ave., Chicago, Ill.....1916
LERMOND, N. W., Thomaston, Me.....1921
LEVEY, Mrs. WILLIAM, 58 Doris Ave., Brookline, Mass.....1915
LEWIS, GEORGE P., 4559 Forrestville Ave., Chicago, Ill.....1920
LEWIS, HARRISON F., 92 Argyle Ave., Ottawa, Canada.....1912
LEWIS, Mrs. HERMAN E., 180 Grove St., Haverhill, Mass.....1912
LIBBEY, ROBERT M., 911 22nd St., N. W., Washington, D. C.....1920
LIGHTFOOT, WILLIAM G., 197 Gileson St., Canandaigua, N. Y.....1920
LIEBOLD, ERNEST G., 589 Boston Blv'd E., Detroit, Mich.....1918
LIGON, J. STOKLEY, Box 131, Albuquerque, New Mexico.....1912
LINGS, GEO. H., Richmond Hill, Cheadle, Cheshire, England.....1913
LINK, HENRY A., P. O. Box 76, Waterloo, Ind.....1920
LITTLE, LUTHER, 2nd, 1403 Garfield Ave., So. Pasadena, Calif.....1913
LLOYD, HOYES, 406 Queen St., Ottawa, Canada.....1916
LOCKE, Dr. EDWIN A., 311 Beacon St., Boston, Mass.....1920
LOCKWOOD, DEAN P., Haverford Pa.....1921
LOMAX, Dr. CLAUDE, Holland, Indiana.....1921
LONG, CHAS. IRVING, 130 5th Ave., Roselle, N. J.....1918
LONG, HARRY V., 260 Clarendon St., Boston, Mass.....1920
LORD, J. ANDERSON, 13 Ash St., Danvers, Mass.....1919
LORING, J. ALDEN, Owego, N. Y.....1917
LOTHROP, Dr. OLIVER A., Waban, Mass.....1920
LOW, ETHELBERT I., 38 E. 64th St., New York, N. Y.....1907
LUCE, Mrs. FRANCIS P., Box 216, Vineyard Haven, Mass.....1912
LUCE, MATTHEW, Cohasset, Mass.....1920

LUM, EDWARD H., Chatham, N. J.....1904
LUNN, Miss LULU M., 724 Villa St., Racine, Wisc.....1920
LUNN, Miss MARGARET A., 131 A-B Govt. Hotels, Washington, D.C1919
LYNCH, JOSEPH, 400 Washington St., Perth Amboy, N. J.....1920
LYON, WILLIAM I., 124 Washington St., Waukegan, Ill.....1921
MACKAYE, JAMES, 160 Elm St., N. Cambridge, Mass.....1921
MACKINTOSH, RICHARDS B., 5 Howard Ave., Peabody, Mass.....1919
MACLAY, MARK W., Jr., 107 E. 81st St., New York, N. Y.....1905
MACCOY, CLINTON V., 1244 Beacon St., Brookline, Mass.....1920
MACLEAN, Miss MAE, 514 Terry Ave., Seattle, Wash.....1920
MACREYNOLDS, GEORGE, 76 E. State St., Doylestown, Pa.....1917
MADDOCK, Miss EMELINE, Monte Vista, Philadelphia, Pa.....1897
MADISON, HAROLD LESTER, Lennox Bldg., Cleveland, Ohio.....1912
MAGEE, M. J., 603 South St., Sault Ste. Marie, Mich.....1919
MAHER, J. E., 351 Communipaw Ave., Jersey City, N. J.....1902
MARBLE, RICHARD M., Woodstock, Vt.....1907
MARCOTTE, Rev. LEON, St. Charles Seminary, Sherbrooke, Quebec, Canada.....1921
MARKS, EDWARD SIDNEY, 655 Kearney Ave., Arlington, N. J.....1915
MARRS, Mrs. KINGSMILL, 9 Commonwealth Ave., Boston, Mass.....1903
MARSHALL, ALFRED, Daphne, Baldwin Co., Ala.....1916
*MARSHALL, Mrs. ELLA M. O., New Salem, Mass.....1912
MARTENET, MARK S., 429 N. Washington St., Alexandria, Va.....1919
MARTIN, FRED I., R't 1, Box 58, Manchester, N. H.....1921
MARTIN, JOHN C., 909 State St., Owosso, Mich.....1921
MASON, C. E., Jr., 25 Exeter St., Boston, Mass.....1921
MATHEWS, F. SCHUYLER, 17 Frost St., Cambridge, Mass.....1917
MAY, FRANKLIN H., 807 E. Adams St., Syracuse, N. Y.....1920
MAYFIELD, Dr. GEORGE R., Kissam Hall, Nashville, Tenn.....1917
MAYNARD, CHAS. J., 457 Crafts St., W. Newton, Mass.....1921
MAYNARD, Dr. HERBERT E., 178 Commonwealth Ave., Boston, Mass.1921
MCCABE, T. T., The Beresford, 1 W. 81st. St., New York, N. Y.... 1920
MCCALL, W. W., Millbrook Road, Haverford, Pa.....1921
MCCLINTOCK, NORMAN, 504 Amberson Ave., Pittsburgh, Pa.....1900
MCCONNELL, T. L., 151 Center Ave., Emsworth, Pittsburgh, Pa.... 1915
MCCOOK, PHILIP J., 413 E. 57th St., New York, N. Y.....1895
MCGRAW, HARRY A., 1805 15th Ave., Altoona, Pa.....1917
MCGREW, ALBERT D., 5611 Stanton Ave., Pittsburgh, Pa.....1917
MCILHENNY, EDWARD AVERY, Avery Island, La.....1894
MCINTIRE, Mrs. HERBERT BRUCE, 4 Garden St., Cambridge, Mass..1908
MCKEOUGH, Dr. GEO. T., R't. 1, Erie Manor, Blenheim, Ontario,...1921
MCLAIN, ROBERT BAIRD, Box 546, Wheeling W. Va..... 1893
MCLELLAN, Miss MARY E., 2935 Pine Ave., Berkeley, Calif.....1920
MCMILLAN, Mrs. GILBERT N., Delafield Ave., Riverdale on Hudson, New York, N. Y.....1902

McMULLEN, T. E., 551 Bailey St., Camden, N. J.....1920
McNEIL, Dr. CHAS. A., 1112 West 4th St., Sedalia, Mo.....1919
McNEIL, GEORGE M., 195 Lincoln St., Winthrop, Mass.....1920
McPHAIL, FRANK L., 1315 Hill St., Ann Arbor, Mich.....1920
MEAD, Mrs. E. M., 303 W. 84th St., New York, N. Y.....1904
MEAD, LYLE G., 807 N. Pine Ave., Chicago, Ill.....1921
MEANS, CHAS J., 29 c/o Dr. Gregg, Wellesley, Mass.....1912
MEDSGER, OLIVER P., 9 Columbia Ave., Arlington, N. J.....1919
MELLEN, ELEANOR, M. D., 291 Lake Ave., Newton Highlands, Mass.1920
MENGEL, G. HENRY, 739 Madison Ave., Reading Pa.....1913
MENNINGER, WM. C., 106 23rd St., Elmhurst, L. I., N. Y.....1919
MERCUR, J. WATTS, Jr., Wallingford, Pa.....1920
MERRIAM, HENRY F., Orange Heights Ave., W. Orange, N. Y.....1905
MERRILL, D. E., Rogers, Ark.....1913
MERRILL, HARRY, 316 State St., Bangor, Maine.....1883
MERRIMAN, R. OWEN, 96 W. 2nd St., Hamilton, Ont.....1920
*MERSHON, W. B., Saginaw, Mich.....1905
METCALF, F. P., Biological Survey, Washington, D. C.....1917
METCALF, Z. P., N. C. State College, West Raleigh, N. C.....1913
MEYER, Major G. RALPH, 51st Artillery Camp Eustis, Va.....1913
MEYER, Miss HELOISE, Lenox, Mass.....1913
MICKEL, Prof. CLARENCE R., Box 417, Rocky Ford, Colo.....1920
MIDDLETON, R. J., Jeffersonville, Pa.....1920
MILLER, ANSEL B., Springs, Pa.....1921
MILLER, Miss BERTHA S., Capstone Farm, R. 3, Kingston, N. Y....1915
MILLER, Miss CARRIE ELLA, 36 Cottage St., Lewiston, Me.....1918
MILLER, CECIL A., 76 Flatt Ave., Hamilton, Ontario, Canada.....1921
MILLER, Miss JULIA, R't. 3, Hornell, Steuben Co., N. Y.....1921
MILLER, Miss MARY MANN, 5928 Hayes Ave., Los Angeles, Calif... 1921
MILLER, Mrs. ELISABETH C. T., 1010 Euclid Ave., Cleveland, O.... 1916
MILLS, ENOS A., Estes Park, Colo.....1916
MILLS, WIER R., Pierson, Iowa.....1920
MINER, LEO D., 1836 Vernon St., N. W., Washington, D. C.....1913
MITCHELL, CATHERINE ADAMS, Riverside, Ill.....1911
MITCHELL, HORACE HEADLEY, Provincial Mus., Regina, Sask.....1918
MITCHELL, Dr. WALTON I., Paonia, Delta Co., Colo.....1893
MONK, H. C., Avoca Apts., Nashville, Tenn.....1921
MOODY, A. J., c/o. Aetna Life Ins. Co., Hartford, Conn.....1918
MOODY, Dr. WM. LADD, Newport, R. I.....1918
MOORE, Mrs. DWIGHT, Cedar Hill, Closter, N. J.....1920
MOORE, ELIZABETH PUTNAM, North Anson, Me.....1905
MOORE, R. L., 205 W. Wilbarger St., Vernon, Texas.....1921
MOORE, WILLIAM H., Mouth Kiswick, Rt. 1, York Co., N. B.....1920
MORCOM, G. FREAN, 2906 Pine Ave., Berkeley, Calif.....1886
MORGAN, BRENT M., 224 11th St., S. W., Washington, D. C.....1919
MORLEY, S. GRISWOLD, 2635 Etna St., Berkeley, Calif.....1911

MORRIS, Miss LUCY N., 90½ Midland Ave., Montclair, N. J.....1920
MORRISON, ALVA, 2 Garden Terrace, Cambridge, Mass.....1915
MORRON, THADDEUS D., 1901 Park St., Hartford, Conn.....1920
MORSE, FRANCIS E., 23 Bradlee St., Dorchester 24, Mass.....1921
MORSE, FRANK E., 162 Boylston St., Boston, Mass.....1921
MORSE, GEO. F., Jr., Grove Hall, Mass.....1919
MORSE, HARRY GILMAN, Huron, Ohio.....1912
MORSE, Miss M. E., 3513 Bloomington Ave., Minneapolis, Minn....1919
MORSS, CHAS. B., 35 Greanleaf St., Bradford, Mass.....1918
MOSELEY, Prof. EDWIN LINCOLN, Bowling Green, Ohio.....1918
MOSES, Mrs. EDMUND QUINCEY, Apt. 4. B, 700 Riverside Drive, New York, N. Y.....1919
MOSHER, FRANKLIN H., 17 Highland Ave., Melrose Highlands, Mass1905
MOULTON, HERBERT F., 36 W. Main St., Ware, Mass.....1920
MOUSLEY, WM. HENRY, Hatley, Quebec, Canada.....1915
MULLEN, JAMES L., 1264 Logan Ave., Salt Lake City, Utah.....1919
MUNRO, J. A., Okanagan Landing, British Columbia.....1913
MUNRO, Mrs. WALTER S., 40 N. Main St., So. Norwalk, Conn.....1920
MURIE, O. J., 219 7th Ave., S., Moorhead, Minn.....1913
MURPHY, Dr. EUGENE EDMUND, 432 Telfair St., Augusta, Ga.....1919
MURPHY, EDW. A. C., 94 Prospect St., New Haven, Conn.....1920
MURPHY, Mrs. GRACE E. B., 87 Front Ave., Bronxville, N. Y.....1919
MURRAY, EDGAR H., 2940 Clinton Ave., Detroit, Mich.....1919
MUSGRAVE, Mrs. MARK E., Box 765, Phoenix, Ariz.....1920
MUSSELMAN, GUY N., 392 E. Main St., New Holland, Pa.....1921
MYERS, Mrs. HARRIET W., 311 N. Ave. 66, Los Angeles, Calif.....1906
MYERS, Miss LUCY F., 127 Academy St., Poughkeepsie, N. Y.....1898
NAUMAN, E. D., Box 606, Sigourney, Iowa.....1918
*NEELY, JAMES C., 135 High St., Brookline, Mass.....1919
NEFF, JOHNSON A., Marionville, Mo.....1919
NEWBERRY, W. F., 233 Broadway, New York, N. Y.....1920
NEWCOMB, C. A., Jr., Rt. 3, Pontiac, Mich.....1920
NICE, Mrs. MARGARET M., Norman, Okla.....1920
NICHOLS, L. NELSON, N. Y. Public Library, New York, N. Y.....1917
NICHOLS, RODMAN A., 27 Broad St., Salem, Mass.....1919
NICHOLSON, NEVIN G., 410 Elm St., Grove City, Pa.....1920
NILES, Mrs. C. F., Hopedale, Mass.....1920
NIMS, Mrs. LUCIUS, 17 Union St., Greenfield, Mass.....1913
NINNINGER, Prof. H. H., McPherson College, McPherson, Kan.....1920
NOBLE, ELEANOR G., 66 Sparks St., Cambridge, Mass.....1916
NOBLE, G. KINGSLEY, Am. Mus. Nat. Hist., New York, N. Y.....1913
NOKES, Dr. I. D., 1120 Marsh St., Los Angeles, Calif.....1915
NOLTE, Rev. FELIX, St. Benedict's College, Atchison, Kan.....1903
NORRIS, EDWARD, 301 W. Springfield Ave., Philadelphia, Pa.....1916
NORRIS, J. PARKER, JR., 2122 Pine St., Philadelphia, Pa.....1904

NOTT, Miss ETHEL A., 309 S. Pine St., Reedsburg, Wis.....1920
NUGENT, JAMES R., 772 Broad St., Newark, N. J.....1920
*O'CONOR, JOHN CHRISTOPHER, 24 E. 33rd St., New York, N. Y....1921
OGDEN, DAVID B., 23 Alton Place, Brookline, Mass.....1920
OGDEN Dr. HENRY VINING, 141 Wisconsin St., Milwaukee, Wis..... 1897
OLDYS, HENRY, Silver Springs, Md.....1896
ONDESCO, Miss MARY E., Gardner, Ill.....1920
O'ROARK, Mrs. L. S., R. 2, Mt. Kemble, Norristown, N. J.....1919
OSBORN, Prof. HENRY F., Am. Mus. Nat. Hist., New York, N. Y... 1919
OSBORNE, ARTHUR A., 183 Lowell St., Peabody, Mass.....1912
OSLER, H. S., 1, Rosedale Road, Toronto, Ont.....1920
OTTEMILLER, FRED, 752 S. George St., York, Pa.....1914
OVER, WILLIAM H., Geol. and Nat. Hist., Survey, Vermillion, S. Dak1921
OVERTON, Dr. FRANK, Patchogue, N. Y.....1909
*OWEN, Miss JULIETTE AMELIA, 306 N. 9th St., St. Joseph, Mo.....1897
PACKARD, WINTHROP, 1442 Washington St., Canton, Mass.....1917
PAINE, AUGUSTUS G., JR., 31 E. 69th St., New York, N. Y.....1886
PAINE, CHARLES JACKSON, 705 Sears Bldg., Boston, Mass.....1917
PAINTER, KENYON V., 3240 Fairmount Blv'd., Cleveland, Ohio.....1920
*PALMER, Miss E. D., 1741 S. Harvard Blv'd., Los Angeles, Calif... 1918
PALMER, R. H., Instituto Geologico, City of Mexico, D. F., Mexico...1916
PALMER, Dr. SAMUEL C., 712 Ogden Ave., Swarthmore, Pa.....1899
PALMER, Mrs. T. S., 1939 Biltmore St., N. W., Washington, D. C...1918
PANGBURN, CLIFFORD H., 299 Madison Ave., New York, N. Y.....1907
PARKER, ARTHUR JOHN, So. Lincoln, Mass.....1920
*PARKER, EDWARD LUDLOW, Nashawtuc Rd., Concord, Mass.....1916
PARKER, HERBERT, So. Lancaster, Mass.....1920
PATCH, Dr. EDITH M., College Road, Orono, Me..... 1921
PATTEN, Dr. STEPHEN K., 141 Milk St., Boston, Mass.....1920
PAUL, LUCIUS H., 436 Carter St., Rochester, N. Y.....1908
PAXTON, Mrs. REGINA A., 59 Walmer Road, Toronto, Ontario..... 1917
PEABODY, Rev. P. B., Blue Rapids, Kan.....1903
PEACOCK, W. C., State and Adams St., Chicago Ill.....1921
PELLEW, Miss M. J., 1637 Mass. Ave., N. W., Washington, D. C... 1919
PEMBER, KARL A., Woodstock, Vt.....1921
PEMBERTON, JOHN ROY, Box 1112, Tulsa, Okla.....1918
*PENROSE, Dr. CHAS. BINGHAM, 1720 Spruce St., Philadelphia, Pa...1919
PEPPER, Dr. WM., 1813 Spruce St., Philadelphia, Pa.....1911
PERCIVAL, Mrs. D. C., 306 Commonwealth Ave., Boston, Mass..... 1921
PERINE, KEBLE, 3 Ware St., Dorchester, Mass.....1917
PERKINS, Dr. ANNE E., State Hospital, Collins, N. Y.....1917
PERKINS, ARTHUR W., 21 High St., Farmington, Me.....1915
PERKINS, EDW. H., Box 52, Waterville, Me.....1920
PERKINS, Dr. GEORGE H., Univ. of Vt., Burlington, Vt.....1912
PERRY, Dr. HENRY JOSEPH, 45 Bay State Road, Boston, Mass.....1909

PERSCHON, ERICH, Young America, Carver Co., Minn.....1921
PETER, JULIUS C., Detroit Trust Co., Detroit, Mich.....1921
PETERS, ALBERT S., Lake Wilson, Minn.....1908
PETERS, Jos. G., Jr., North Truro, Mass.....1921
PETERSON, ALFRED, Pipestone, Minn.....1920
PETTY, ORVILLE A., Chapel St. & Sherman Ave., New Haven, Conn. 1919
PHELPS, FRANK M., 212 E. 4th St., Elyria, Ohio.....1912
PHELPS, Mrs. J. W., Box 36, Northfield, Mass.....1899
PHELPS. WARREN A., 19 Tennyson Ave., Pittsfield, Mass.....1920
PHILIPP, PHILIP B., 220 Broadway, New York, N. Y.....1907
PHILLIPS, ALEXANDER H., 54 Hodge Road, Princeton, N. J.....1891
PHILLIPS, CHAS. LINCOLN, 5 West Weir St., Taunton, Mass.....1912
PHILLIPS, CHAS. P., Univ. Minn., Minneapolis, Minn..... 1919
*PHILLIPS, JOHN M., 2227 Jane St., Pittsburgh, Pa.....1920
PIERCE, WRIGHT MCEWEN, Box 343, Claremont, Calif.....1918
PILSBURY, FRANK O., 1088 Main St., Walpole, Mass.....1917
PINCHOT, GIFFORD, 1218 Real Estate Trust Bldg., Philadelphia, Pa..1910
PIRNIE, MILES D., McGraw Hall, Ithaca, N. Y.....1919
PITMAN, Mrs. FRED H., Winthrop, Me.....1921
PLATT, Hon. EDMUND, 2339 Ashmead Pl., N. W., Washington, D. C. 1917
POE, Miss MARGARETTA, 1204 N. Charles St., Baltimore, Md.....1899
POMEROY, E. F., Battes College, Lewiston, Me.....1920
POOLE, EARL L., Public Museum, Reading, Pa.....1916
POPE, ALEXANDER, 1013 Beacon St., Brookline, Mass.....1919
POPE, E. F., Box 113, El Reno, Okla.....1920
PORTER, LOUIS H., Stamford, Conn.....1893
POST, WILLIAM S., Bernardsville, N. J.....1911
POTTER, JULIAN K., 563 Bailey St., Camden, N. J.....1912
POTTER, LAWRENCE B., Gower Ranch, Sask.....1919
POWERS, Miss EVA L., Greenwich Village, R. D., Mass.....1920
PRAEGER, WILLIAM E., 421 Douglas Ave., Kalamazoo, Mich.....1892
PRATT, Hon. GEO. D., Pratt Ins'te, 215 Ryerson St., Brooklyn, N. Y.1917
PRENTISS, Rev. WM. C., Plainfield, Conn.....1921
PRESCOTT, Mrs. CLARA R., 87 High St., Orange, N. J.....1921
PRICE, JOHN HENRY, Crown W. Ranch, Knowlton, Mont.....1906
PRICE, LIGON, Marlinton, W. Va.....1913
PRILL, Dr. A. G., Scio, Oregon,.....1921
PRITCHARD, Mrs. F. A., 203 N. Court St., Medina, Ohio.....1918
PROCTOR, GEORGE N., 35 Congress St., Boston, Mass.....1919
PULITZER, JOSEPH, Jr., St. Louis Post-Dispatch, St. Louis, Mo..... 1921
PURDIE, Miss EVELYN, 49 Ware Hall, 383 Harvard St., Boston, Mass1921
PURDY, JAMES B., R. F. D. 1, Plymouth, Mich.....1893
PURDY, WILLIAM B., Milford, Oakland Co., Mich.....1921
QUARLES, EMMET AUGUSTUS, 139 E 7th St., Plainfield, N. J.....1918
QUILLIN, ROY W., 1025 Summit Ave., San Antonio, Tex.....1920

RACEY, KENNETH, 3262 First Ave., Vancouver, B. C.....1921
RAKER, Miss MARY E., 1484 Sherman St., Portland, Ore.....1918
RAND, Mrs. HARRY SEATON, 1899 Mass. Ave., Cambridge 13, Mass..1920
RATLIFF, Hon. WALTER S., R. R. B., Box 276, Richmond, Ind.....1918
RAVEN, HENRY CUSHIER, c/o. South Side Bank, Bayshore, N. Y.... 1918
RAYMOND, Miss BESSIE, 564 Diagonal Road, Akron, Ohio.....1920
REA, Dr. PAUL M., Lennox Bldg., Cleveland, Ohio.....1912
REAGH, Dr. ARTHUR LINCOLN, 39 Maple St., West Roxbury, Mass.. 1896
REED, Mrs. BESSIE, 1609 Vermont St., Lawrence, Kan.....1920
REED, Miss CLARA EVERETT, Brookfield, Mass.....1919
REED, MONTAGUE, 357 Fifth Ave., Rosemont, Montreal, Canada....1921
REESE, Mrs. ROBT. M., 3016 Dumbarton Ave., N. W., Wash., D. C. 1920
REGAR, H. SEVERN, 1400 De Kalb St., Norristown, Pa.....1916
REHN, JAMES A. G., Acad. Nat. Sciences, Logan Sq., Philadelphia, Pa. 1901
REICHENBERGER, Mrs. VICTOR M., Hotel Essex, New York, N. Y..... 1919
REID, Mrs. BRUCE, Gulf Refinery, Port Arthur, Tex.....1918
REID, RUSSELL, 208 3rd. St., Bismarck, N. Dak.....1919
REIS, JACOB A., Jr., c/o Amer. Presb. Mission Krebi, Cameroon, W. Afr1921
RETT, EGMONT Z., 3060 Larimer St., Denver, Colo.....1917
RHOADS, CHARLES J., 1914 S. Rittenhouse Sq., Philadelphia, Pa.....1895
RICE, Miss HELEN M., Holton Arms School, 2125 S. St., N. W., Washington D. C.....1920
RICE, JAMES HENRY, Jr., Brick House Plantation, Wiggins, S. C.....1910
RICE, WARD J., Roachdale, Ind.....1913
RICH, WALDO L., Box 221, Saratoga Springs, N. Y.....1921
RICHARDS, Miss HARRIET E., 36 Longwood Ave., Brookline, Mass...1900
RICHARDS, Miss RUTH, Clifton Sta., Fairfax Co., Va.....1921
RICHARDSON, FREDERICK S. W., Charles River, Mass.....1921
RICHARDSON, JENNESS, Zool. Mus. Univ. Minn., Minneapolis, Minn. 1920
RICHARDSON, W. D., 4215 Prairie Ave., Chicago, Ill.....1917
RICHARDSON, WYMAN 224 Beacon St., Boston, Mass.....1920
RIDGWAY, JOHN L., Mus. Hist., Sci. and Art, Los Angeles, Calif.....1890
RIES, DONALD T., 401 Thurston Ave., Ithaca, N. Y.....1920
RIIS, PAUL P., 301 Shaw St., Rockford, Ill.....1920
RIKER, CLARENCE B., 437 Scotland Road, South Orange, N. J.....1885
ROBB, WALLACE H., Congress Sq., Hotel, Portland, Me.....1921
ROBBINS, CHARLES A., Onset, Mass.....1914
ROBBINS, REGINALD C., Hamilton, Mass.....1921
ROBBINS, Mrs. REGINALD C., Hamilton, Mass.....1921
ROBERTS, PREWITT, Conway, Mo.....1919
ROBERTS, WILLIAM ELY, 207 McKinley Ave., Lansdowne, Pa.....1902
ROBERTSON, HOWARD, 157 S. Wilton Drive, Los Angeles, Calif.....1911
ROBERTSON, JOHN McB., Box 121, Buena Park, Orange Co., Calif...1920
ROBINSON, ANTHONY W., P. O. Box 426, Haverford, Pa.....1903
ROBINSON, Mrs. L. K., 1130 S. Franklin St., Denver, Colo.....1919
ROBINSON, Miss MARY L., 122 W. 33rd St., Kansas City, Mo.....1919
ROGERS, Miss MABEL F., 475 Lisgar St., Ottawa, Ontario, Canada..1921

ROGERS, Rev. WALLACE, 202 Third Ave., Rome, Ga.....1921
ROOSEVELT, FRANKLIN DELANO, Hyde Park, N. Y.....1896
ROSE, GEORGE C., Ellenville, N. Y.....1920
ROSE, RALPH H., South Kortright, N. Y.....1921
ROSS, GEO. H., 23 West St., Rutland, Vt.....1904
ROSS, Dr. LUCRETIUS H., 507 Main St., Bennington, Vt.....1912
ROTNOUR, A. B., 711 Park Ave., Ellwood City, Pa.....1921
ROUSH, GEO. HAROLD, 145 Beverly Ave., Morgantown, W. Va.....1919
ROWAN, Prof. WILLIAM, Univ. of Alberta, Edmonton, Alta.....1920
RUGG, HAROLD GODDARD, Dartmouth College, Hanover, N. H.....1919
RUST, HENRY J., Coeur d'Alene, Idaho.....1918
SACKETT, CLARENCE, Rye, N. Y.....1910
SAGE, HENRY M., Menands Road, Albany, N. Y.....1885
SAGE, Mrs. MARY SEARL, 1974 Broadway, New York, N. Y.....1919
SALYER, J. CLARK, 2412 Main St., Lexington, Mo.....1919
SAMPSON, Dr. JOHN A., 180 Washington Ave., Albany, N. Y.....1920
SAMPSON, Miss MYRA M., 7 Paradise Rd., Northampton, Mass.....1918
SANBORN, COLIN C., P. O. Box 55, Chicago, Ill.....1911
SANDERSON, Miss EVA E., 729 Dedham St., Newton Centre, Mass...1920
*SANFORD, Dr. LEONARD C., 216 Crown St., New Haven, Conn..... 1919
SANTENS, REMI H., Carnegie Museum, Pittsburgh, Pa.....1918
SATTERTHWAIT, Mrs. A. F., 118 Waverly Place, Webster Groves, Mo1920
SAUNDERS, Mrs. E. J., 122 N. Friends Ave., Whittier, Calif.....1921
SAVAGE, JAMES, 1097 Ellicott Sq., Buffalo, N. Y.....1895
SAVIN, WILLIAM M., 52 Broadway, N. Y.....1921
SAWYER, C. J., 22 Lincoln St., Hudson, Mass.....1920
SCHAEFFER, OSCAR FREDERICK, 669 Genesee St., Rochester, N. Y... 1916
SCHAFER, J. J., Port Bryon, Ill.....1918
SCHANTZ, ORPHEUS M., 1649, Otis Bldg., Cicero, Ill.....1919
SCHNEIDER, Mrs. ELIZABETH, 261 Broadway, Methuen, Mass.....1920
SCHNEIDER, Mrs. G. H., 4618 Kingswell Ave., Los Angeles, Calif....1921
SCHONNEGEL, JULIAN ELIOT, 92 Morningside Ave., New York, N. Y.1918
SCHORGER, A. W., 2021 Kendall Ave., Madison, Wis.....1913
SCHRENCK, Dr. HERMANN, Tower Grove and Flad Aves., St. Louis, Mo.....1919
SCHRODER, HUGO H., 303 E. State St., Bettendorf, Iowa.....1920
SCOTT, Miss JANET RUTH, Vassar College, Poughkeepsie, N. Y.....1921
SCOVILLE, SAMUEL, Jr.., 415 Lancaster Ave., Haverford, Pa..... 1916
SCUDDER, Dr. WALTER H., Litchfield, Medina Co., Ohio.....1920
SEELEY, GEORGE H., Box 106, Stockbridge, Mass.....1920
SERRILL, WILLIAM J., Haverford, Pa.....1916
SHA, ROY H.; Apt. 38, 1321 Belmont St., N. W., Washington D. C..1920
SHARP, ARTHUR R., 99 Chauncy St., Boston, Mass.....1921
SHAW, HENRY S., 78 Cypress St., Newton Center, Mass.....1916
SHAW, Dr. J. E. NORTON, Mattapoisett, Mass.....1919

SHAW, WILLIAM T., 1000 Thatuna St., Pullman, Wash.....1908
SHEA, DANIEL W., Catholic Univ. of Amer., Washington, D. C.....1917
SHEAK, WILLIAM H., 154 N 21st St., Philadelphia, Pa.....1921
SHELDON, CHARLES, 3102 Q. St., N. W., Washington, D. C.....1911
SHELDON, H. H., Commercial Tr. Bank, Santa Barbara, Calif.....1919
SHELTON, ALFRED C., c/o Johnson, Shelton Co., Dayton, Ohio.....1911
SHERWOOD, ROBERT C., 38 Vassar St., Springfield, Mass.....1920
SHIRLEY, LESTER L., 144 Buntin St., Vincennes, Ind.....1917
SHIRLING, ALBERT E., 3849 E. 62nd St., Kansas City, Mo.....1919
SHOEMAKER, CLARENCE R., 3116 P St., Washington, D. C.....1910
SHOEMAKER, HENRY W., Room 1201, 71 Broadway, New York,.....1912
SHOFFNER, CHAS. P., 17 Rolling R'd, Springfield, Pa., (Rt. 3.) Media1915
SHROEDER, Mrs. A. P., White River S. Dak.....1920
SHUMWAY, FRANK R., 100 Brunswick St., Rochester, N. Y.....1920
SILLIMAN, O. P., Cor. Alisal & Riker Sts., Salinas, Calif.....1915
SIMONS, C. DEWAR III, Peacock Inn Annex., Princeton, N. J.....1920
SIMMONS, GEORGE FINLAY, Univ. of Texas, Austin, Tex.....1910
SKINNER, M. P., Yellowstone Park, Wyo.....1916
SLAWSON, Dr. EDW. DOUGLASS, 407 Center Ave., Bay City, Mich... 1921
SLEEPER, LAWRENCE, 198 St. Paul St., Brookline, Mass.....1920
SMITH, AUSTIN PAUL Apt. 412, San Jose, Costa Rica.....1911
SMITH, CHARLES E., 261 New Boston Road, Fall River, Mass.....1920
SMITH, Mrs. FLORENCE, Box 145, Cincinnatus, N. Y.....1920
SMITH, Rev. FRANCIS CURTIS, 820 Genesee St., Utica, N. Y.....1903
SMITH, Prof. FRANK, 1005 West California Ave., Urbana, Ill.....1909
SMITH, HENRY A. P., Digby, Nova Scotia, Canada.....1921
SMITH, HORACE G., 2918 Lafayette St., Denver, Colo.....1888
SMITH, Dr. HUGH M., 1209 M St., N. W., Washington, D. C.....1886
SMITH, JESSE L., 141 So. 2nd St., Highland Park, Ill.....1920
SMITH, LESTER W., 60 Cottage St., Meriden, Conn.....1916
SMITH, Miss LOTTIE M., R. F. D. Box 6, So. Sudbury, Mass.....1920
SMITH, NAPIER, Magog, Quebec, Canada.....1915
SMITH, THOMAS, 124 Howe St., Methuen, Mass.....1920
SMITH, Mrs. WALLIS C., 525 N. Mich. Ave., Saginaw, W. S., Mich...1916
SMITH, WENDELL PHILLIPS, Wells River, Vt.....1919
SMYTH, Prof. ELLISON A., Jr., Polytechnic Inst., Blacksburg, Va....1892
SMYTH, Prof. THOMAS, Hampden-Sidney Coll., Hampden-Sidney, Va.1921
SNYDER, LESTER L., Royal Ont. Mus., Toronto, Ont.....1919
SNYDER, WILL EDWIN, 309 DeClark St., Beaver Dam, Wis.....1895
SPEAR, H. M., 71 Octavia St., Belleville, Ontario..... 1921
SPELMAN, HENRY M., 48 Brewster St., Cambridge, Mass.....1911
SPENCER, Miss C. S., Dept. of Zool., Coe College, Cedar Rapids, Ia..1917
SPERRY, CHARLES C., Biological Survey, Washington, D. C.....1920
SPIKER, CHARLES J., New Hampton, Iowa.....1921

SPRAGUE, ISAAC, Wellesley Hills, Mass.....1920
STACKPOLE, FRED H., 120 Wellington Hill St., Mattapan, Mass..... 1920
STANWOOD, Miss CORDELIA JOHNSON, Ellsworth, Me.....1909
STEELE, HENRY B., 4530 Drexel Boulevard, Chicago, Ill.....1917
STEPHENSON, Mrs. JESSE, Monte Vista, Colo.....1918
STEWART, J. B., Roselle, N. J.....1921
STILES, EDGAR C., 345 Main St., West Haven, Conn.....1907
STIMSON, Dr. ARTHUR M., 414 Raymond St., Chevy Chase, Md.....1917
STODDARD, HERBERT L., Milwaukee Public Mus., Milwaukee, Wis...1912
STONE, Mrs., FRANCIS H., So. Dartmouth, Mass.....1920
STONE, HARRY HERBERT, Jr., Sturbridge, Mass.....1919
STONE, Mrs. WITMER, c/o. Acad. Nat. Sciences, Philadelphia, Pa....1920
STORER, TRACY IRWIN, Mus. Vert. Zoology, Berkeley, Calif.....1916
STORROW, Mrs. JAMES J., Lincoln, Mass.....1920
STRATTON, Mrs. GEORGE W., 439 Rebecca Ave., Wilkinsburg, Pa....1920
STREET, J. FLETCHER, Beverly, N. J.....1908
STREIT, RAYMOND E., 66 Broadway, New York, N. Y.....1921
STRONG, WM. DUNCAN, 2522 Ridge Road, Berkeley, Calif.....1921
STRUTHERS, Prof. P. H., Univ. of Porto Rico, Mayagues, P.R.....1921
STUART, FRANK A., 118 Green St., Marshall, Mich.....1915
STUART, GEO. H., 3rd, 923 Clinton St., Philadelphia, Pa..... 1913
STURTEVANT, EDWARD, St. George's School, Newport, R. I.....1896
SUGDEN, ARTHUR W., 35 Concord St., Hartford, Conn.....1913
SUMNER, Mrs. GRAHAM, Linden Ave., Englewood, N. J.....1920
SUTTON, GEO. MIKSCH, Carnegie Mus., Pittsburgh, Pa.....1919
SWAIN, JOHN MERTON, 113 Main St., Farmington, Me.....1899
SWEENEY, J. A., Forest Service, Nenzel, Neb..... 1916
SWEET, Miss ORA D., 34 Elizabeth St., Auburn, N. Y.....1919
SWIFT, JOSEPH B., 46 Mattapan St., Boston, Mass.....1920
SWOPE, Dr. EUGENE, Mt. Healthy, Cincinnati, Ohio.....1921
TALBOT, L. R., 509 Audubon Road, Boston, Mass.....1920
TATNALL, SAMUEL A., 503 Hansberry St., Philadelphia, Pa.....1916
TAYLOR, ALEXANDER R., Coyce, S. C.....1907
TAYLOR, HORACE, 131 Kent St., Brookline, Mass.....1917
TAYLOR, LIONEL E., Bankhead, Kelowna, B. C.....1913
TAYLOR, Dr. WALTER P., c. o. Scripps Institute, La Jolla, Calif..... 1916
TAYLOR, WARNER, 219 Clifford Court, Madison, Wis.....1916
TEACHENOR, DIX, 510 Rialto Bldg., Kansas City, Mo.....1919
TERRELL, CLYDE B., 83 Monument Sq., Oshkosh, Wis.....1920
TERRILL, LEWIS McI., 44 Stanley Ave., St. Lambert, Quebec.....1907
TERRY, Miss ALICE P., 89 State St., New Bedford, Mass.....1920
TERRY, Dr. ROBERT J., 5315 Delmar Ave., St. Louis, Mo..... 1919
TEST, Dr. FRED'K C., 4620 Greenwood Ave., Chicago, Ill.....1920
THABES, Mrs. J. A., 417 Holly St., Brainerd, Minn.....1920
THOMAS, GERALD B., Box 1124, Billings, Mont.....1919

THOMAS, JOHN G., Thos. Power Bldgs., 1200 Niagara St., Buffalo, N. Y.....1921
THOMPSON, J. W., 527 East First South St., Salt Lake City, Utah...1916
THOMPSON, STUART L., 529 Roxton Road, Toronto, Ontario.....1921
THOWLESS, HERBERT L., 765 Broad St., Newark, N. J.....1919
TINDALL, CHAS. W., 912 N. Noland St., Independence, Mo.....1919
TINKER, ALMERIN D., 519 Oswego St., Ann Arbor, Mich.....1907
TIPPETTS, Mrs. KATHERINE B., Belmont Hotel, St. Petersburg, Fla..1921
TOLFREE, EDWARD R., 71 W. 11th St., New York, N. Y.....1921
TOMLINSON, IRVING C., 1249 Little Bldg., Boston, Mass.....1920
TOOTH, Mrs. OLLIE, Litchfield, Medina Co., Ohio.....1921
TORREY, Miss EDITH E., 164 Huntington Ave., Boston, Mass.....1920
TOWER, Mrs. KATE D., Hotel Bristol, Copley Sq., Boston, Mass.... 1908
TOWLE, WILLIAM M., 323 Pearl St., Burlington, Vt.....1921
TOWNE, Dr. SOLON RODNEY, Sta. D., Route 2, Omaha, Neb.....1919
TOWNSHEND, HENRY H., 35 Hellbourne Ave., New Haven, Conn....1915
TREGANZA, A. O., 522 S. 13th East St., Salt Lake City, Utah.....1906
TROTTER, WILLIAM HENRY, 36 N. Front St., Philadelphia, Pa.....1899
TRUESDELL, JOHN F., 230 Post Office Bldg., Denver, Colo.....1918
TRUMBELL, J. H., Plainville, Conn.....1907
TUDBURY, WARREN C., 1930 Marin Ave., Berkeley, Calif.....1903
TUPTS, ROBIE W., Wolfville, Nova Scotia.....1919
TULLOCK, Mrs. GILBERT 379 Edgewood Ave., New Haven, Conn....1919
TURNER, WARREN H., 16 Greendale Ave., Worcester, Mass.....1920
TUTTLE, HENRY EMERSON, Groton School, Groton, Mass.....1909
TUTTLE, Mrs. F. MAY, 1114 State St., Osage, Iowa.....1920
TWITCHELL, A. H., Flat, Alaska.....1918
TYLER, JOHN G., Box 173, Fresno, Calif.....1912
UNDERDOWN, HENRY T., 401 Chestnut St., Philadelphia, Pa.....1921
UNDERWOOD, WM. LYMAN, Mass. Inst. of Tech., Cambridge, Mass.. 1900
URNER, CHARLES A., 613 Cleveland Ave., Elizabeth, N. J.....1920
VALENTINE, Miss ANNA J., Bellefonte, Pa.....1905
*VANDERGRIFT, S. H., 311 Riggs Bldg., Washington, D. C.....1918
VAN NAME, WILLARD G., Am. Mus. Nat. Hist., New York, N. Y....1900
VARICK, Dr. WM. REMSEN, 857 Elm St., Manchester, N. H.....1920
VARS, HAROLD N., Box 81, Plainfield, Conn.....1921
VETTER, Dr. CHARLES, 67 West 12th St., New York, N. Y.....1898
VIERECK, HENRY L., Biological Survey, Washington, D. C.....1916
VORHIES, Dr. CHAS. T., Univ. of Ariz., Tucson, Ariz..... 1918
WADSWORTH, CLARENCE S., 27 Washington St., Middletown, Conn..1906
*WALCOTT, FREDERICK C., 17 E. 42nd St., New York, N. Y.....1921
WALKER, EDITH F., 614 County St., New Bedford, Mass.....1920
WALKER, ERNEST P., Juneau, Alaska.....1918
WALKER, GEO. R., R. D. 3, Murray, Utah.....1909
WALLACE, CHAS. R., 69 Columbus Ave., Delaware, Ohio.....1913

WALLACE, JAMES S., 12 Wellington St., E. Toronto, Ontario.....1907
WALTER, Dr. HERBERT E., 67 Oriole Ave., Providence, R. I.....1901
WALTERS, FRANK, 71, 40th St., Corona, Long Island, N. Y.....1902
WARD, FRANK H., 18 Grove Place, Rochester, N. Y.....1908
WARNER, EDWARD P., 1 Kennedy R'd., Cambridge, Mass.....1910
WATERMAN, Miss MARY E., Williamstown, Vt.....1921
WATERMAN, WILLARD H., Auburn, Me.....1920
WATSON, C. G., 201 Ridout St., S., London, Ont.....1919
WATSON, JAMES D., 6047 Harper Ave., Chicago, Ill.....1917
WATSON, LUCIUS H., 4123 Sheridan Blv'd, Lincoln, Neb.....1920
WEBER, J. A., Moore and Grand Aves., Leonia, N. J.....1907
WEBSTER, Dr. GEORGE A., Roxbury, Mass.....1916
WEBSTER, Mrs. JENNIE E. B., 44 E. 23rd St., New York, N. Y.....1917
WEEKS, Rev. LEROY TITUS, Emmetsburg, Iowa.....1918
WEGENER, Mrs. MIRIAM, 119 Waverly Place, Webster Groves, Mo.. 1921
WEISEMAN, T. WALTER, 226 Beaver Road, Emsworth, Pittsb'gh, Pa. 1919
WEISER, CHARLES S., 105 W. Springettsbury Ave., York, Pa.....1916
WELLS, Miss CAROLINE, 502 S. 4th St., W, Missoula, Mont.....1920
*WELLMAN, GORDON B., 46 Dover R'd., Wellesley, Mass.....1908
WEST, CHAS. SLADE, Marianna, Fla.....1919
WETMORE, Mrs. EDMUND H., Box 497, Babylon, N. Y.....1902
WEYGANDT, Dr. CORNELIUS, 6635 Wissahickon Ave., Philad'a, Pa...1907
WEYL, EDWARD S., 6506 Lincoln Drive, Mt. Airy, Phila., Pa.....1921
*WHARTON, WILLIAM P., Groton, Mass.....1907
WHEELER, Mrs. JAMES W., 403, 15th Ave., N., Seattle, Wash.....1918
WHITE, DONALD, 21 A, Sweetser St., Wakefield, Mass.....1920
WHITE, FRANCIS BEACH, St. Paul's School, Concord, N. H.....1891
WHITE, GEORGE R., 181 Wurtemberg St., Ottawa, Canada.....1903
WHITE, W. A., 158 Columbia Heights, Brooklyn, N. Y.....1902
WHITING, WILLARD C., 584 Plymouth St., E. Bridgewater, Mass.... 1920
WHITMAN, F. N., 2028 E. 100 St., Cleveland, Ohio.....1919
WHITNEY, GEOFFREY G., Highland St., Milton, Mass.....1920
WHITNEY, THOMAS H., Atlantic, Iowa.....1920
WHITNY, HOWARD, 45 East St., Hartford, Conn.....1921
WHITTLE, CHARLES L., 50 Congress St., Boston, Mass.....1916
WHITTLE, Mrs. H. G., 10 Chauncy St., Cambridge, Mass.....1920
WIEGMANN, Dr. WILLIAM HENRY, 436 E. 5th St., New York, N. Y..1916
*WIGGLESWORTH, Dr. EDW., Boston Soc. Nat. Hist., Boston, Mass.. 1920
WILBUR, ADDISON P., 60 Gibson St., Canandaigua, N. Y.....1895
WILCOX, T. FERDINAND, 118 E. 54th St., New York, N. Y.....1895
WILEY, Miss LENA CATHERINE, Buckland, Mass.....1918
WILLARD, BERTEL G., 51 Fresh Pond, P'kway, Cambridge, Mass....1906
WILLARD, FRANK C., Farmingdale, N. Y.....1909
WILLARD, OSCAR T., 1444 E. 54th St., Chicago, Ill.....1919
WILLCOX, Prof. M. A., 63 Oakwood Road, Newton, 60, Mass..... 1913

WILLIAMS, LEWIS B., 706 Citizens Bld'g, Cleveland, Ohio.....1920
WILLIAMS, LAIDLAW, 152 W. 57th St., New York, N. Y.....1919
WILLIAMS, ROBERT S., N. Y., Botanical Gardens. New York, N. Y..1888
WILLIAMSON, E. B., Bluffton, Ind.....1900
WILLIS, Mrs. HERBERT B., 425 Tremont St., Taunton, Mass.....1920
WILLWARTH, E. S., 11 Lincoln Hall, Trinity Court. Boston 17, Mass.1920
WILMOT, NELSON E., 40 Marshall St., West Haven. Conn.....1916
WILSON, Mrs. ETTA S., 9077 Clarendon Ave., Detroit, Mich.....1917
WILSON, GORDON, 1434 Chestnut St., Bowling Green, Ky.....1919
WING, DEWITT C., 5344 Dorchester Ave., Chicago, Ill.....1913
WINGARD, TODD ALBERT, 1173 Say Ave., Columbus, Ohio..... 1918
WISE, Miss HELEN D., 1930 18th St., N. W., Washington, D. C.....1919
WOLFE, PATRICK R., 6732 Honore St., Chicago, Ill.....1921
WOOD, Dr. GEORGE B., 1830 Spruce St., Philadelphia., Pa.....1916
WOODMAN, Dr. WALTER, 14 Hubbard Park, Cambridge, Mass.....1920
WOODRUFF, FRANK M., Acad. of Sciences, Lincoln Park, Chicago, Ill..1894
WOODRUFF, LEWIS B., 14 E. 68th St., New York, N. Y.....1886
WOODWARD, Dr. LEMUEL, 52 Pearl St., Worcester, Mass.....1917
WOODWORTH, ROY C., 4615 Harrison St., Kansas City, Mo.....1908
WOOLMAN, Miss ANNA, 21 N. Highland Ave., Lansdowne, Pa.....1920
WORCESTER, Mrs. ALFRED J., 314 Bacon St., Waltham, Mass.....1908
WRIGHT, FRANK S., 14 Cayuga St., Auburn, N. Y.....1917
WRIGHT, Miss HARRIET H., 1637 Gratiot Ave., Saginaw, W. S., Mich1907
WRIGHT, Miss MARY A., 33 Kirkland St., Cambridge, Mass.....1920
WYMAN, Mrs. FRANCES L., Hubbardston, Mass.....1920
WYMAN, LUTHER E., 3965 Dalton Ave., Los Angeles, Calif.....1907
YOUNG, Rev. CHAS. JOHN, Brighton, Ont., Canada.....1918
YOUNG, FRANCIS E., Hanover, Mass., (R. F. D. Rockland).....1920
YOUNG, JOHN P., Ithaca, N. Y.....1911
ZIEGLER, G. FRED Jr., Greencastle, Pa.....1920
ZIMMER, J. T., Field Museum, Chicago, Ill.....1908
ZUCKERMAN, JOSEPH, Am. Mus. Nat. Hist., New York, N. Y.....1919
ZUTAVERN, LOUIS J., 2370 Forest Ave., Great Bend, Kas.....1921



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J. A. Allen

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IN MEMORIAM: JOEL ASAPH ALLEN.[1]

BORN JULY 19, 1838—DIED AUGUST 29, 1921.

BY FRANK M. CHAPMAN.

Plate 1.

DR. JOEL ASAPH ALLEN, a Founder of the American Ornithologists' Union, died after a short illness at Cornwall-on-the-Hudson, New York, on August 29, 1921, in the eighty-fourth year of his life. Five years before his death at the urgent solicitation of the President of the American Museum of Natural History, Dr. Allen consented to prepare a brief autobiography as an introduction to a bibliography of his scientific publications. This was published in November, 1916.[1] Only one familiar with Dr. Allen's retiring nature can realize the extreme reluctance with which he complied with President Osborn's request; but having set his hand to the task, he determined not to spare himself and with the thoroughness which marked all his work he prepared a history of his life and critical analysis of his dominant characteristic traits.

The value of this obviously authoritative document is so great

[1] Read before the thirty-ninth Meeting of the A. O. U. at Philadelphia, November 9, 1921.

[2] Autobiographical Notes and a Bibliography of the Scientific Publications of Joel Asaph Allen. 8vo. pp. xi + 215.

that it is clearly not only the privilege but the duty of the biographer to use Dr. Allen's own words in recording the more intimate, personal side of the history of his life. Of especial interest is the account of his boyhood and the light it throws on the first manifestations of his inborn love of nature.

"I was born," Dr. Allen writes, "in Springfield, Massachusetts, July 19, 1838, the eldest son of Joel and Harriet (Trumbull) Allen, both of early New England stock. My father was a descendant in the seventh generation, of Samuel Allen who settled in Windsor, Connecticut, in 1640 . . . On the maternal side the descent is from John Trumbull, great-grandfather of Governor Jonathan Trumbull (said to have been the original of 'Brother Jonathan' and familiar friend of Washington) who was born in Newcastle-on-Tyne, and settled in Roxbury, Massachusetts, in 1639.

"My immediate progenitors were farmers. My father, however, learned the carpenter's trade and was a house-builder in his earlier days, but later bought a farm on which he spent the greater part of his life . . . My father had little appreciation for my natural history tastes, but was kind and generous, offering to share his farm with me if I would remain with him on the old homestead. My mother, on the other hand, was much in sympathy with my yearnings, and often used her influence in my favor."

Dr. Allen had a sister and three brothers. One of the latter died in infancy, a second became a moulder and the third a farmer. He therefore was the only member of his family to exhibit those traits which marked him as the born naturalist, and the possession of which are evidently not to be accounted for by direct inheritance, environment or association with others.

"My early training," Dr. Allen continues, "was rigidly puritanical. My parents were both members of the Congregational church, and strict in their religious observances. Family prayers invariably followed breakfast, and also closed the routine of Sunday, all the religious requirements of the day being strictly observed.

"My earliest recollections are naturally associated with the surroundings of my birthplace on the old farm, situated on a hill about a mile and a half east of the then thickly settled part of Springfield, known as the Watershops, where the United States

Government has for more than a century carried on the manufacture of firearms. The family home was a large two-story square-roofed house, at the time innocent of paint and unshaded by trees. One of the pleasantest memories of my younger days is of helping my father plant the row of maples and elms which long since became the prominent feature of the road frontage of the farm, and in recovering and painting the house. We were not crowded by neighbors, the nearest residence on the west being half a mile away, and there was only one house within half a mile to the eastward. Subsequently others much nearer were built in both directions, the lonely country road has become Allen Street, and a trolley car has been projected to connect the rapidly extending suburbs with the business portion of the city.

"Dandelions and daisies and other wild flowers were early attractions, the profuse gathering of which at an early age led my elders, and particularly my mother, to predict that when the toddling youngster grew up he would favor the profession of medicine, and I was often facetiously dubbed 'Dr. Sykes', in allusion to our then family physician, an herb-doctor of local reputation. In due time I was assigned a share in the household chores, and trained to preform the allotted tasks with promptness and care.

"The nearest schoolhouse was a mile distant, of the conventional red type, situated as usual on the crest of a hill. In summer the school was taught by a schoolmistress, while the winter session was conducted by a schoolmaster selected for his ability to keep the larger boys in order as well as to teach the 'three Rs.' Some years later a schoolmistress was employed for both winter and summer sessions. In those days the services of boys of even six and seven years were considered too valuable for farm-work to be sacrificed in summer for school purposes, so that to them only the winter session of the school year was available.

"Despite hard work and long hours, the farm proved attractive and satisfying for a time, but at about the age of fourteen the love inspired by this free contact with natural surroundings developed a desire to know more of the animal and plant life, the soil and the rocks, and the ever changing phenomena of sky and air, than could be gained merely by association.

"At the age of thirteen, after much pleading on my part, to my great delight, my father presented me with a gun. At first it merely afforded the pleasure all boys experience in being able to shoot something, either as game or on the pretext that certain birds and animals are destructive to crops, and that it is desirable to reduce their numbers. But very soon the destructive instinct gave place to a desire to possess specimens for study, particularly of birds, which I found were so numerous in kinds that comparatively few of them were known by name to any of the people, either of town or country, whom I met. Warblers, vireos, kinglets, sparrows and many other kinds of birds were shot, measured, weighed, described and given provisional names in my notebooks, so that I might again recognize them when met with, long before I knew that books had been written about them and that they all had names, Latin as well as English. I even made attempts to draw and color them, but entire lack of instruction in the work led only to failure and disappointment. A little later, however, I made the acquaintance of Bradford Horsford, a teacher of drawing, who was also an amateur ornithologist and taxidermist, with a good knowledge of all the commoner birds. From him I borrowed a copy of the Brewer edition of Wilson's 'American Ornithology,' which, to my unspeakable delight, he later sold to me; Nuttall's and Audubon's works on North American birds were also found in the public library of Springfield, and a new world was opened to me.

"A little later I made the acquaintance of a man of broader education than I had ever before met, who taught our district school for several winter terms, and became a resident of the neighborhood. As he was a nature-lover himself he could appreciate my aspirations, and most generously presented me with a copy of Blythe's 'Cuvier's Animal Kingdom,' a work of which I previously had never heard. Thus equipped, and with the resources of a public library now at my command, acquaintance with not only the local birds, mammals, reptiles and fishes, but with many of the insects, became a delightful experience. Interest in farm work as an occupation as rapidly declined, but a filial desire to share fully in the family burdens led to no neglect of duties but often to excessive effort in manual labor to demonstrate an interest otherwise unfelt."

During the winters of 1858–62, Dr. Allen attended Wilbraham Academy, working on his father's farm in the summer and devoting all his spare time to the study of such works on natural history as were available. "During this period," he states, "my ever present ambition was to write a history of the 'Birds of New England' that should be as complete and exhaustive as possible, and based on original observation, including the necessary explorations in northern New England where so many of the migratory species were supposed to pass the breeding season. Next to this I looked upon editorial work as an enviable goal. Yet at the time these aspirations began to develop composition was a slow and difficult task, and to acquire facility in writing I forced myself to keep a daily journal, in which I recorded not only the current weather conditions in detail but every incident of my daily experiences that seemed to offer a subject for comment . . . During the years 1859–1861, I collected and mounted (as attested by my catalogue, still extant) some 300 birds, representing nearly 100 species, and also such native mammals as I could find near my home, and I preserved in jars of alcohol specimens of all the reptiles, amphibians and fishes; such mollusks as were available were also gathered and several hundred insects. Best of all, I knew the technical names of nearly all except the insects, of which, however, I knew many. The local minerals and rocks found place on the shelves of my little museum, for which a small room was kindly provided by my parents, and which I equipped with shelves and a flat table case for insects. In addition there were rows of bottles containing the products of my boyish experiments with such cheap chemicals as I could afford to purchase at the neighboring drug store, each duly labeled with its proper chemical formula. The whole was amateurish in the extreme, and represented merely a superficial acquaintance with a wide range of subjects, but enough to add immensely to the pleasure of living, giving, as it did, the sense of being in touch with plant and animal life and the geological features of my immediate environment. My notebooks contained pages of descriptions of unusual atmospheric phenomena, from the prismatic tints of fleecy clouds floating past the midday sun, haloes, unusual storm conditions, auroral displays, and the August and November shooting-star

periods, to the varied forms of the snow crystals of a winter storm —things for the most part unobserved by my friends and neighbors, and which hence gave them no added joy to living.

"It is needless to say that my interest in every day practical affairs was limited to a conscientious and cheerful discharge of the obligations natural to my position as a helper to my father in the routine of farm work. Every spare moment of the day, when in the house, was spent in my room poring over books or specimens or jotting down things seen out of doors in the corn or hay field. These constant disappearances when off duty were naturally an annoyance to my father, who could not appreciate my absorption in such unpractical affairs. To the oft-made inquiry of my father, 'Where's Asaph?' was mother's gentle response, 'upstairs,' and the contemptuous paternal rejoinder: 'Upstairs; he's always upstairs.' Although unappreciative of his son's 'foolish notions,' he was not harsh or unkind, as an agreement, lasting for several seasons, granting one day a week for the prosecution of my hobbies is ample evidence. For these foibles my mother had always a degree of sympathy, which increased as years passed, to active influence in their behalf.

"To demonstrate my hearty interest in forwarding the farm work, I often, as I afterwards found, exerted myself beyond my proper physical endurance, which with the absorption in natural history work told heavily on my health. It was often necessary in the busy season for my father to employ day laborers and it was always my ambition to 'lead the field,' which I was always able to do except in the heavier work, even when a young boy just entering the teens. My evening task, before retiring, was to write in my journal the notes of the day and to change the dryers in my extemporized botanical press, consisting of several pieces of thick board, cut the proper length, a lot of old newspapers, and a heavy, smoothly waterworn stone for the top of the pile to afford the requisite pressure. Many, many a time this bedtime task found me almost too exhausted by the day's labor to accomplish. These long periods of overwork undoubtedly laid the foundation for much of the semi-invalidism of many later years."

In 1861 Dr. Allen reluctantly sold his beloved collections to Wilbraham Academy in order that he might raise funds to con-

tinue his studies at that institution, where he formed the friendship of William Harmon Niles, a student who was planning to enter the Lawrence Scientific School to study under Louis Agassiz. Niles induced Allen to join him and, with the balance of the sum received for his collections, he went to Cambridge in 1862. Thus was begun an association which, with some breaks due to ill-health or absence on expeditions was to last until 1885 when Dr. Allen left the Museum of Comparative Zoology to enter the American Museum of Natural History.

Dr. Allen continued his studies under Agassiz for the greater part of the succeeding three years and, on March 26, 1865, sailed with his great teacher as a member of an expedition to Brazil. They arrived at Rio Janeiro April 22, and after collecting in the vicinity of that city for some weeks, Dr. Allen was detailed to join a smaller party which left June 9 for the northern provinces of Brazil. After a difficult journey of somewhat over six months he reached Bahia. Although so far from well during this period that he was obliged to abandon the plan to reach the coast at Ceará, Dr. Allen's collections included several cases of birds, mammals, mollusks, and zoological specimens besides six or eight barrels of fishes, reptiles and other vertebrates in alcohol; and his notebooks contained many pages of detailed observations on the country through which he had passed, its flora and fauna.

On December 15, Dr. Allen sailed from Bahia on a 300 ton brigantine and after a trying voyage, during which they were blown from Cape Hatteras back to St. Thomas, they dropped anchor off Woods Hole, Massachusetts, 90 days out from Bahia.

Chronic indigestion now forced Dr. Allen to abandon museum work and return to the farm; but he had experienced the joy of exploration and as soon as his health permitted he took the field again, collecting in June, 1867, on Sodus Bay, Lake Ontario, and during the summer, in Illinois, Indiana and southern Michigan. At the end of this time he was physically so greatly improved that in October, 1867, he returned to the Museum of Comparative Zoology to act as Curator of birds and mammals in that institution.

After a year in the study, the winter of 1868–69 was devoted to zoological exploration on the headwaters of the St. John's river,

then a primeval part of Florida. This expedition supplied in part the material on which was based Dr. Allen's classic memoir 'On the Mammals and Winter Birds of East Florida, with an examination of certain assumed specific Characters in Birds and a Sketch of the Bird-Faunae of Eastern North America.' This paper, published as a Bulletin of the Museum of Comparative Zoology in 1871, at once placed Dr. Allen in the first rank of philosophic naturalists.

The results of the Florida expedition having been reported upon, Dr. Allen started, in April, 1871, on a nine months' collecting trip to the great Plains and Rocky Mountains in the interests of the Cambridge Museum. General collections were made at intervals from the Missouri River to the Great Salt Lake, the selection of locality being largely dependent upon the movements of hostile Indians. At Fort Hays, Kansas, the arrival of a military escort being delayed, Dr. Allen and his two assistants went buffalo hunting, accompanied by only a single hunter, securing and preparing in eight days, of which thirty-six hours were occupied in traveling, fourteen complete skeletons and several additional skulls representing both sexes and various ages, from yearlings to old bulls and cows, also the skins as well as skeletons of five young calves. This collection was supplemented the following January by the skins of eight buffalo in winter pelage.

July and part of August were passed in Colorado, where *Leucosticte australis* was discovered on the summit of Mount Lincoln, and after ten days at Cheyenne, Dr. Allen went to Oregon, Utah, which became his base for the ensuing seven weeks. In October he worked at Green River and Fort Fred Steele, and from October 20 to December 18 at Percy. Here he secured the assistance of two native hunters and the collections, chiefly of big game, shipped from this point nearly filled a freight car. December 19 he started eastward and after a short stop in Kansas to secure buffalo he reached Cambridge on January 22, 1872. The collection made on this expedition included 200 skins, 60 skeletons and 240 additional skulls of mammals (mostly large species); 1500 birds' skins, over 100 birds in alcohol, a large number of birds' nests and eggs,recent and fossil fishes, mollusks, insects and crustaceans.

The following year Dr. Allen, representing both the Cambridge

Museum and the Smithsonian Institution, again went to our western frontier on this occasion as chief of the scientific staff attached to the survey of the Northern Pacific Railroad. Railhead on this road was then at Fargo, North Dakota, beyond which construction trains ran as far as Bismarck.

The work of the expedition lay in the country between Bismarck and a point on the Musselshell River about fifty miles northwest of Pompey's Pillar on the Yellowstone, a distance of about 550 miles. The journey occupied some three months from June 20.

The region was infested by actively hostile Indians who had so interfered with the survey for the railroad route that an escort of 1400 troops under General Custer accompanied the expedition. It was only three years later that this officer and his entire command were killed some sixty miles south of the most western point reached by Dr. Allen.

After passing the mouth of the Powder River, the expedition was in daily contact with Indians, and twice was attacked in force. Orders were given forbidding the naturalists to use firearms or to leave the line of march, and Dr. Allen writes, "The opportunities for natural history collecting and field research on this expedition were far from ideal," but some specimens and much valuable data were secured which later formed the basis of a report of some sixty pages. With the exception of a visit to Colorado with William Brewster, in 1882, made chiefly to regain his greatly impaired health, Dr. Allen did not again enter the field. His collecting days, therefore, were ended before those of most of his colleagues were well under way, and few who knew him only in the study realized the extent of his travels, the dangers on sea and land to which he had been exposed, and the amount of material he had secured. The present day naturalist, who travels in palatial steamers or follows well-worn trails, has but faint conception of the discomforts of a 90-day voyage in a small sailing vessel, and has perhaps never experienced the risk of being himself collected.

From 1876 to 1882 Dr. Allen gave his time wholly to research, producing his monographs on the 'American Bison Living and Extinct' and 'North American Pinnipeds,' the latter a volume of 800 pages. The intensity with which he applied himself to these

and other tasks during this period overtaxed his always limited reserve powers and for long periods he was able to do little or no work.

When the trustees of the American Museum, under the presidency of Morris K. Jesup, decided to make research as well as exhibition the function of that institution, their choice naturally fell upon Dr. Allen as the head of the department of birds and mammals, a post which Dr. Allen entered on May 1, 1885.

This was the beginning of a new period in his life as well as that of the museum. Although the museum's exhibition halls had a fair representation of the leading types of birds and mammals, there was no study collection of the latter, and only about 3000 study specimens of the former. The 50,000 skins and skulls of mammals at present in the museum were all, therefore, acquired during the period of Dr. Allen's curatorship, and, to him in large measure is due the size and importance of the study collection of birds. Two years after Dr. Allen came to the museum the Lawrence Collection of 12,000 specimens was purchased and this was followed by the Herbert Smith Collection of 4000 birds from southwestern Brazil, the Scott Collection from Arizona, and the collections of Arizona birds presented by Dr. E. A. Mearns, and of Hummingbirds by D. G. Elliot. At this time also the invaluable ornithological library of Dr. Elliot was acquired. The first three years of his connection with the museum, Dr. Allen worked alone, but on March 1, 1888, the writer was appointed his assistant and today the combined staffs of the now separate departments of birds and mammals number seventeen.

Relieved now of the actual care of the growing collections, Dr. Allen devoted himself to their study, and the publications of the Museum during the succeeding third of a century bear testimony to his industry and productiveness. During this period he published 37 papers on birds and 150 on mammals, based wholly or largely on museum material. To his duties as Curator were soon added those of Editor, a post which his natural qualifications and experience especially fitted him to occupy. For thirty-two years all the zoological publications of the Museum, including 37 volumes of the Bulletin and 22 of the Memiors, passed through his hands and a regrettably large part of his time was consumed by the preparation of copy for the press and the reading of proof.

Dr. Allen was eagerly welcomed to New York by the resident naturalists of the city, and he was at once placed on the Council of the Academy of Sciences, and later was made President of the Linnaean Society, but he soon found that the duties of each day demanded all his strength and he was able to take only a small part in the scientific activities of the city. He, however, was one of the organizers of the original Audubon Society and to the end was an active director of this society and its virtual successor in New York, the National Association of Audubon Societies. But by far the greater part of the time Dr. Allen could spare from his curatorial labors was given to the American Ornithologists' Union in the welfare of which he was as much concerned as a father in the well-being of his first-born. Indeed to Dr. Allen might well be applied the title Father of the American Ornithologists' Union. He played a leading part in its organization, served as its President during the first seven years of its existence, and was a member of its Council until the day of his death. He edited three volumes of the Union's 'Check-List' of North American Birds, and for 28 years was editor of its official organ 'The Auk', during which period he contributed 643 papers, reviews and obituary notices to that publication.

Only one in daily contact with Dr. Allen can realize the extent of the demands upon his time and strength made by his duties for the Union, and the loving attention he gave to its affairs. It occupied a place in his affections second ouly to that held by members of his family and he never spared himself in advancing its aims.

Dr. Allen was chiefly responsible for the formulation of the Union's 'Code of Nomenclature,' a subject in which he took a deep interest and on which he was an authority. For years he served as Chairman of the Union's Committee on Classification and Nomenclature, and for the last ten years of his life he was a member of the Commission on Zoological Nomenclature of the International Congress of Zoology.

In 1879, after five years of wedded life, Dr. Allen's first wife, Mary Manning Cleveland, of Cambridge, died leaving him his only child, Cleveland Allen, now in business in New York City.

Seven years later, and a year after coming to the American Museum, Dr. Allen married Susan Augusta Taft, of Cornwall-on-

Hudson, who survives him. "I owe to her deep love and sympathy," Dr. Allen writes, "to her supreme optimism and constant watchfulness over my health, and to her inspiration, the greater part of the little I may have achieved in these last thirty years and doubtless many years of activity beyond those I otherwise would have attained."

Dr. Allen's distinguishing characteristics as a man were, modesty, sincerity, unselfishness, gentleness, consideration for others, a purity of mind and purpose which made it difficult for him to believe that anyone was not actuated by the same direct, guileless motives which ever animated him. I do not recall ever hearing him speak ill of another, but he was unsparing in his condemnation of careless work, and particularly of generalizations based on insufficient data. But so impersonal was his attitude, so impossible was it for him to cherish resentment, that while for an author he would show only helpful consideration, for his work, honesty would compel him to be merciless. I have seen him treat with fatherly kindness a man whose theories he had subjected to fatally destructive criticism.

As a student Dr. Allen was inspired by love of truth for truth's sake and by an intense absorbing interest in his work. His powers of application and concentration were phenomenal; his enthusiasm for research so unlimited that he constantly overtaxed his physical resources and the end of the day often found him on the verge of complete exhaustion. But so vitalizing was his love for his profession that, in spite of a frail physique, and the fact that he never rested from his labors when it was a possible thing to pursue them, he was actively engaged in research to within a few weeks of his death.

But he was never too absorbed in his work to be interested in that of others; an appeal to him for advice or assistance received his whole-hearted attention and he made your problem his. The writer owes him a debt which accumulated during thirty-four years of almost daily association. Coming to the museum in March, 1888, as an inexperienced assistant, he found in Dr. Allen not only a friend but a teacher to whom he might turn for instruction in even the most trivial matters with the assurance that he would meet with a sympathetic response. Dr. Allen's counsel was

always based on a logical consideration of the facts at issue; for as far as was humanly possible, he eliminated the personal equation in reaching conclusions.

The inestimable privilege of securing Dr. Allen's advice was sought, therefore, not only by members of his staff, but by workers in other departments of the museum and in other institutions. On one occasion Prof. W. B. Scott, the eminent palaeontologist, came to him for an opinion on the skull of a recent fossil rodent. Dr. Allen, who remembered characteristics of quadrupeds far better than he did those of biped mammals, mistook Scott for Theodore Roosevelt, and only after expressing to me his surprise at his caller's profound knowledge of his subject did he discover that he had made an error in identification.

In spite of the physical limitations from which he suffered, and by which he was handicapped, it is impossible to consider Dr. Allen's career without feeling that few men have more nearly and more happily approached the full measure of their potential achievements.

The guiding star which rose on his youthful horizon shone brightly almost to the day of his death, and he followed it with ever increasing joy and confidence. Only a few weeks before his last illness, as he was exulting over the possibilities of the early receipt of large collections from the field, he said "I am just as enthusiastic as ever."

To the boy under the spell of the romance of a naturalist's life I commend these lines written by Dr. Allen as he approached his eightieth year: "All I aspired to was opportunity for scientific research, believing that diligence, singleness of purpose, and honest work would bring its own reward. I was content to follow my own lines of dominating interest to such limit as the circumstances of earning a living would permit. I have never had any desire for money as such, nor any interest whatever in financial projects, nor any longing for honors beyond those my colleagues in science saw fit to impose."

And with the passing years these honors came to him from every quarter of the globe. Harvard gave him the Humboldt scholarship, the University of Indiana the degree of Doctor of Philosophy, the Boston Society of Natural History, the Walker

Grand Prize, the Linnaean Society of New York its medal. He was elected a member of the National Academy of Sciences in 1876, an Honorary Member of the New York Zoological Society in 1887, an Honorary Fellow of the Zoological Society of London in 1901, and an Honorary Member of the British Ornithologists' Union in 1907, to mention only a few of the institutions on whose rolls his name appeared. And so far was he from realizing his own worth, that always, he writes, such recognition came to him as a "surprise."

And so in the fulness of his years and powers, honored by his colleagues, beloved by his associates, Dr. Allen's life came to its end. For more than three score years and ten he had dedicated himself to the study of nature and he has left to the world the fruits of his labors, a marvellous record of achievement, and an inspiring example of pure, unselfish devotion to the cause of science.

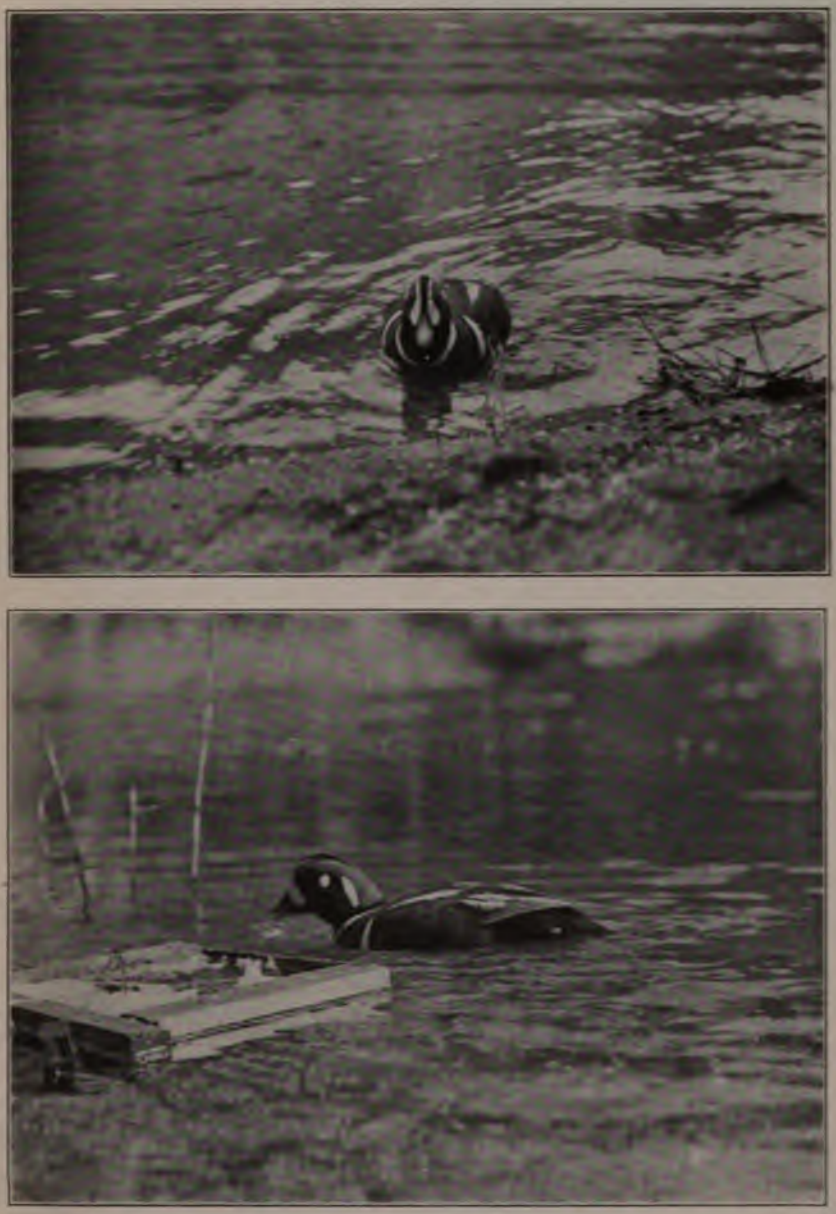
AN ADVENTURE WITH A PAIR OF HARLEQUIN DUCKS IN THE YOSEMITE VALLEY.

BY CHARLES W. MICHAEL AND ENID MICHAEL.

Plates II–III.

IN the Yosemite Valley, during the early spring of 1921, we had the pleasure of intimate and friendly association with the rare and little known Harlequin Duck. Although these birds have long been suspected of nesting in the mountains of California, eggs have never been taken within the confines of the State. Therefore, it was with eagerness that we searched for their nest. The search proved unsuccessful. However, we did get a great deal of pleasure in studying the habits of the birds.

The Harlequins were first noted April 6. From this date until May 10 they were daily visitors at our camp on the edge of the Merced River, where a floating lunch counter was maintained for their especial benefit. The following paragraphs, taken from notes written at the time of observation, may bring out some new points regarding the habits of these birds.



HARLEQUIN DUCKS ON THE MERCED RIVER, YOSEMITE VALLEY, CALIFORNIA

April 7, 1921.—We were about to cross Sentinel Bridge at 1 P. M., when, just above the bridge, we saw a pair of Harlequin Ducks. They were swimming close together and bobbing their heads most energetically. Suddenly the male Harlequin gripped the back of the female's head with his bill and pushed her completely under the water and hopped onto her back. Coition then took place. In fifteen seconds the female was free and flew under the bridge, closely followed by the male. She landed not fifty feet from where she left the water and immediately commenced to dive. The male swam about endeavoring to approach, but on being spurned he too began to dive.

After about three quarters of an hour of feeding the birds swam under the bridge and up the river for about fifty yards. Here they stopped to bathe. With a rapid movement of body and wings they beat the water through their feathers. At times one wing was used to throw the water over the body, at other times both wings were used.

The bath was apparently ended and the male eagerly approached the female, uttering a high, rapidly repeated call. At his close approach the female either dove or wildly beat the water with her wings. This maneuver was repeated several times. After about thirty minutes spent at the bath the birds climbed upon a boulder at the river's edge and prepared to rest. However, their rest was interrupted. Somewhere in the valley a blast was set off and at the sound, as if impelled by one motion, both birds dropped head first into the river, soon to reappear and swim up stream.

A few minutes later they appeared in front of our camp, a hundred yards up stream. Bread was thrown on the water and they ate with great enjoyment, sucking at the large pieces, after the manner of a feeding swan, and swallowing the small pieces.

April 11, 1921.—The Harlequin Ducks came again today. When first seen they were swimming down the river a short distance above camp. As usual the female was in the lead, closely followed by the male. They came at once to the floating lunch counter at the edge of the sandy beach. While the female ate the water-soaked bread the male rested on the water a foot away, slowly paddling his feet and quietly waiting his turn without the least sign of impatience.

Before the female had eaten her fill I walked slowly to the shore and set up the Kodak, on a stand which had been previously arranged. As I approached the birds moved up stream about fifteen feet. In a moment the Kodak was adjusted and I retired out of sight. In less than a minute both birds were back, and the female was eating. When they were in about the right focus the string was pulled and the shutter of the Kodak went off with a snap. At the click of the trigger both birds looked up, but neither showed the least alarm.

Desiring to make other exposures, and fearing lest the birds might satisfy their appetites and leave, I again approached. The birds behaved as before. This preformance was repeated four times. After the second exposure I waited for the female to finish her meal and then the male came to the bread tray. The female was neither attentive to her mate nor considerate. When she was through eating she drifted down stream with not so much as a glance at her handsome companion. While floating a few feet off shore she dipped her bill into the water a number of times. After each dip she raised her head and appeared to swallow. In this manner she washed down her food and then decided to have another mouthful. She came again to the bread and deliberately shoved the male out of her way. She ate calmly, in contrast to the hurried and nervous manner of the male. He gulped his food in awkward haste as if in constant fear of being deserted by his mate.

In spite of the interruptions both birds were through eating in fifteen minutes. Perhaps, the male could have eaten more, but the female was moving up stream and he hurried away to catch her. He moved rapidly against the swift current and was soon in his accustomed position, a few inches in rear of the female. As the birds moved across the water they dipped their bills under the surface in the manner of Shoveller Ducks. However, I am inclined to think that they were drinking rather than feeding.

Just before the birds reached their favorite perch on a partly submerged log they dipped their bodies under the surface of the water several times. Each time they came up they struck their wings against the water, making a great splash. Finally they raised their bodies above the water and flapped their wings vigor-



HARLEQUIN DUCKS ON THE MERCED RIVER, YOSEMITE VALLEY, CALIFORNIA.

ously. A thorough bath they had and then they climbed onto a perch a few inches above the water. While the ducks were sitting on the log a Kingfisher came rattling down stream and alighted on a dead branch ten feet above their heads. Both birds raised their heads and looked up but neither appeared excited nor alarmed.

The birds took turns sleeping. When sleeping they turn their heads half around and rest their bills on their backs. All the while the male was dozing the nictitating membrane over his eye kept flashing like a tiny electric light. These eye-winkings took place about twice every second. When the male awoke the female took a nap. They spent forty minutes here and then a fisherman came down the river-bank and they were frightened away. They swam the swift current to the opposite shore, worked their way up stream, recrossed and drifted down to the feeding station, for another meal. It was just one hour since they last ate. As before the female ate first and the male waited patiently. After this meal they did not bathe, but moved up stream a few yards and stepped out on a root to preen their feathers. Twenty minutes later they were in the water again. This time they drifted past the lunch counter and when they reached the swift riffle below camp the female dove twice. The male waited on the surface for her to reappear and then they went down stream a short distance and disappeared in the dense strand of bare willow shoots.

When the birds appeared in front of camp on the morning of April 12 they were acting strangely. Apparently they were making love. They were bobbing and bowing to one another, swirling around, touching their bills together and uttering little chatty sounds. One of the moves on the female's part was to slowly submerge her body until just her head and neck appeared above the surface of the water—a bold invitation, on her part, for attention. In spite of the wanton actions of the female the love-making failed to reach the climax. When the ceremony was over the birds moved in close to the shore and slowly worked their way up stream, diving every few minutes as they moved. along About two hundred yards up stream they climbed out on a log and rested a few minutes. They preened their feathers but did not sleep. For the first time the male was seen to act first. He slipped into the water and spoke quietly to his mate, as if to coax her into the

water. However, she refused to be coaxed so he climbed back onto the log again. Two minutes later, without any apparent conversation, the birds left the perch and started up stream. On this occasion, and subsequently on many other occasions, we followed the birds along the stream, studying their habits when feeding under natural conditions. The waters of the Merced River are very clear and we could easily follow the movements of the birds, even to a depth of six feet.

Harlequins are expert swimmers and divers. They dive and swim under water with all ease of a grebe, besides possessing the ability of the Water Ouzel to walk about on the river bed against the swift currents. When feeding, so far as we were able to observe, they show no preference as to depth of water. When working up stream along the shore they wade in the shallow water, prying among the stones. Where the water is deeper they tip up in the manner of Mallard ducks, and where the water is still deeper they dive. They dive in water a foot deep and they dive in water six feet deep, always going down where there is a gravelly bottom. Most often they stay under water not more than fifteen seconds. Often they stay down twenty seconds and occasionally they remain under the water as long as twenty-five seconds. To leave the surface of the water they use their wiry tails as a spring to make the plunge and as they go down both wings and feet are used as a medium of propulsion. When once on the gravelly bottom the wings are closed, the head is held low, and the progress is made against the current, as they walk along poking amongst the stones. When coming to the surface they float up like bubbles, without movement of wings or feet. Their bills break the water and their bodies pop suddenly onto the surface where they rest a moment. While poising on the surface between plunges their bodies float high. When earnestly feeding seldom more that ten seconds elapse between plunges. The birds seldom dive simultaneously. The female usually acts first.

At times the Harlequins choose the swiftest riffles and when feeding there, their method is the same as when in the less joyous waters. They apparently dive from any position with equal ease, but always as they go down they turn up stream and even in the swiftest currents they come up in about the same spot at which

they went down. When feeding in these racing waters they merely hesitate on the surface and four or five dives are made in rapid succession. Such work as this is strenuous, but the birds are quite at home in the swiftest currents, and when tired from their exertions they swing into an eddy behind some snag or boulder and rest as they bob about on the surface.

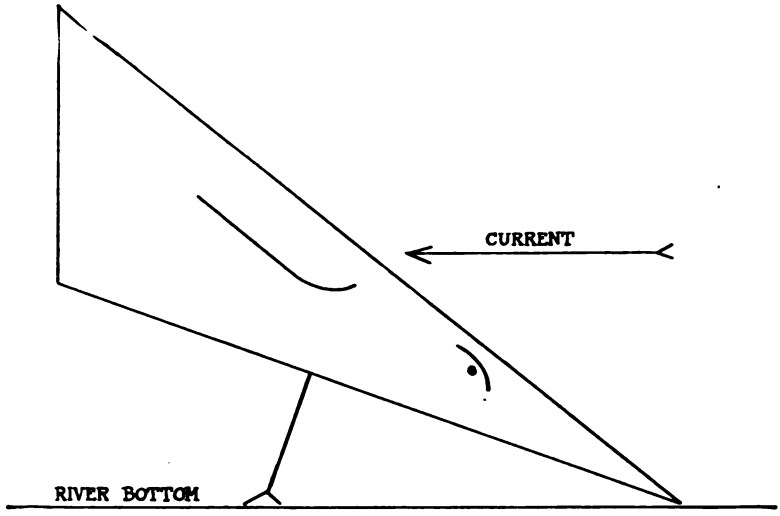


FIG. 1.

The diagram (Fig. 1) shows the method of the Harlequin Duck when feeding under water. The head is held down by physical strength. The current against the angle of body throws pressure on the feet and enables the bird to maintain its position without swimming. Where the current comes with just the right speed the bird may stand still, but in lesser currents the bird must move forward.

The female Harlequin has a large appetite and a wide range in the choice of food. She will eat cooked potatoes, macaroni, meat, raisins and bread. She gets all of these things at the lunch counter and then often pays a visit to the place where the vegetable parings are dumped. She has been seen to eat raw potato peelings. The male never eats so much as the female. He may have the appetite,

but he is so polite that he always waits for the female to finish eating before he starts and then he must gulp his food lest the female desert him while feeding.

Bread, potatoes or other foods taken from the tray were always thoroughly mashed and water soaked before being swallowed. Feeding under natural conditions the bulk of their food probably consists of aquatic insects and it is doubtful if fish are ever taken. Not once did we note the Harlequins feeding on roots, grasses or other growing vegetation; nor were they ever seen to swallow any large object. On certain occasions the female has eaten as many as six full slices of bread in a single day. One slice just about constitutes a meal. Of the different things which were placed on the floating tray bread was the most acceptable.

On the morning of April 22 the male Harlequin came alone. For two weeks the birds had been constant companions and to see the male alone was a surprise; almost a shock, for we could easily believe that something had happened to the female. Flying from up stream he alighted on the water near the feeding tray and as he moved forward he uttered a new note and his voice was louder and clearer than usual. He ate but little and then stepped out on the bank and preened his feathers. In a few minutes he left his perch and flew back up the stream.

After a hasty breakfast we hurried up the river looking for the birds, hoping if they were nesting that we might get an idea of where to look for the nest. Nothing was seen of them until twelve o'clock when the pair was seen flying down stream. We were a mile from camp and when we got back the food tray was empty and both birds were sitting on the bank. They spent most of the afternoon in the vicinity of camp. At six-thirty they had their last meal and then left together, flying up stream.

On the wing the Harlequins are strong and swift, and although they fly with rapid wing beatings they fly silently. In flight they remind one of the Scoters, but they rise more gracefully from the water. There is no splashing of water when they rise and in a few swift wing beats they have caught their stride and are going at full speed. Often in the evening after the last meal of the day they left so silently that we did not hear them go. Their arrivals in the morning were different. There would be the sudden splash

to announce their presence and if the food tray happened to be empty the clear calling voice of the male was soon heard. On one occasion we heard his call but did not answer promptly. When we came out of the tent he was coasting down stream a hundred yards or more away. We called to him and he arose at once from the water and flew back up stream to receive the crumbs that were tossed on the water. While we sat on the bank tossing bits of cake the Harlequin, by paddling his feet, held his position on the river and waited for the food to drift down. He seldom took the food as it came but waited for it to pass on the current and then with a quick turn he would pick it up eating as he drifted a foot or two down stream. He seemed unable to swallow any large object and when a crust of bread came his way he either let it pass or took it in his bill and thoroughly mashed it while holding it under water. Small crumbs that could be taken into the mouth with water seemed to please him most.

From the day the male first came alone the birds were not seen so much together. The male spent much time in the vicinity of camp, but the female was not often seen during the day. She usually came late in the day, however, and would come flying down the river, alight at the food tray, eat a hearty meal, bathe, preen and then fly back up the river at dusk. The male knew of her habits and would be awaiting her arrival. He always became much excited when she arrived and would give her an enthusiastic reception. The female acted differently and would seldom meet his advances with any show of pleasure.

On the evening of April 26 the female refused to have anything to do with the male. She sat on the bank preening her feathers when the male came flying up the river and alighted with a splash some fifteen feet away. He bobbed and bowed, he turned and swayed, and dipped his head under the water, all the while speaking in a low voice. His actions brought no response from the female except that she crouched lower and dipped her bill into the water and remained motionless as if attempting to hide. Finally, after five or six minutes, the male gave up in disgust, swung into the current and sailed off down the river. The female left soon after, going up stream. She was heavy with food, having eaten there slices of bread, and rose from the water with all the grace of a Coot, flapping both wings and feet.

From the day of the first estrangement the female was not seen below camp. Most of her time was spent somewhere up stream. Usually she came to the feeding tray towards evening, but there were a few days when she failed to come at all. When she came in the evening she was always very hungry and would eat two or three slices of bread to satisfy her appetite. After one of these hearty meals she would bathe thoroughly and then climb onto a perch and preen, before flying away up stream. If the male was not about when she arrived he usually put in his appearance before she left. Most often he tried to force his attentions upon her, but occasionally he seemed quite satisfied to linger near and act as guard while the female ate or preened. On these occasions there was much conversation carried on in a low tone of voice, with the male doing most of the talking. If given any encouragement at all the male would leave with his mate when she flew up stream. We had no way of telling how long the birds stayed together. However, they did separate, for the male always appeared alone in the mornings.

When alone the male is timid and hesitates to come to the tray if any one is in sight. Also it has been observed since the birds separated that the male feeds mostly on the surface and seldom dives as he does when the female is about to set example. He has frequently been observed to paddle slowly on the water with his bill held just beneath the surface. His mandibles are kept in constant motion in the manner of feeding Shoveller ducks.

Our experiences with the Harlequins came to an end on the afternoon of May 9. We were in the tent when we heard the loud clear call-note of the male bird. When we got to the river-bank both birds were coming down stream. The female came and ate at the feeding tray while the male stood guard a few feet away. After eating the female worked along the edge of the stream among the stones and roots. The male kept close to her, alert and nervous all the while uttering his low chatty notes, his sole idea being apparently to guard the female. The female ate again at the tray, bathed and dove a number of times and then both birds started to drift down stream on the swift current. When about one hundred yards below camp they rose from the water and flew down stream. They were last seen going under the Sentinel Bridge.

Chief Ranger Forest Townsley reports that a pair of Harlequin Ducks have visited the Yosemite for a number of years. We hope to see them again next year and to have another try for their nest. Last year we noted a lone female as late as July 28.

From the available literature on the subject one might get the impression that Harlequin Ducks are silent birds. However, this was not the case with the particular pair which we had under observation. When the birds were together the male carried on a low, chatty conversation much of the time. The female was more or less silent, and appeared only to speak when she wished to chide her mate. Besides these chatty notes the male had another call, which he uttered in moments of excitement, or when he wished to attract attention. This was a loud, clear "qua, qua, qua," uttered in rapid succession. Occasionally just a single note was uttered which was particularly loud and clear. The low notes might remind one of the conversational notes of the Coot, but the loud call was quite distinctive and could not be compared with the notes of other water birds with which we are familiar.

Yosemite, Calif.

A MYRTLE WARBLER INVASION.

BY CHARLES L. WHITTLE.

FROM February 21, 1920 to March 4, 1920, my wife and I spent the entire daylight time bird cruising about Savannah, Georgia, and Beaufort, Walterboro and Charleston, South Carolina. In addition, several excursions were made for ten or twenty miles south and east of Walterboro. With the exception of February 21 and March 4, the temperature was considerably below the normal for this section of the State and the season was correspondingly late. In fact official reports of the U. S. Weather Bureau for the entire month of February, 1920, show a subnormal average temperature, not only for South Carolina as a whole but for

Georgia and Florida as well. The averages and departures therefrom as a whole were:

		Average Temperature	Departure From Normal.
February, 1920	South Carolina	42.8	—4.10
	Georgia	46.0	—1.40
	Florida	57.1	—2.90

The averages and deficiences of coast stations from Charleston to Key West, Florida, during this period were as follows:

		Average Temperature	Departure From Normal.
February, 1920	Charleston, S. C.	48.2	—3.50
	Savannah, Georgia	49.5	—3.00
	Jacksonville, Fla.	53.9	—3.00
	Miami, Fla.	64.2	—4.00
	Key West, Fla.	68.2	—2.60

Between February 21 and March 3, Myrtle Warblers (*Dendroica coronata*) were met with every day as single individuals, as groups of two or three, or forming part of a band of other birds such as Ruby-crowned and Golden-crowned Kinglets, Carolina Chickadees, White-eyed Vireos, American Goldfinches, Pine, Palm and Yellow-Palm Warblers, Tufted Titmice, etc.

There was no evidence so far as we could detect that plans were underway among the Myrtle Warblers to begin their northward migration; and even the customary movements north and south among migrating species generally, due to alternating unseasonably warm or cold weather, was not apparent as the temperature remained so persistently subnormal during this period, not only in the territory under observation, but, as shown above, throughout Georgia and Florida. The principal evidence that the nesting season was approaching was a slight brightening of the plumage due to an increase in the distinctness of the yellow patches on the sides of the breasts of some of the Myrtle Warblers. Flocks of these birds even ten in number, were nowhere met with during this time, and this was true also of the South Carolina coast region where the Cumbahee River enters the tidal marshes southwest of Charleston, as late as March 2.

On March 3, we journeyed from Walterboro to Charleston, S. C., this city lying about thirty miles a little south of east of the former town; and on the following day we crossed Charleston harbor and went by trolley to the southwest end of Long Island which is locally known as the Isle of Palms. This island is merely a sand bar, about due east of Charleston, with the ocean on one side and an extensive salt marsh on the other. Many dunes occur here and these and the intervening hollows are covered in large part with dense thickets of a composite growth, but wax myrtle, so common a mile to the southwest, is practically absent.

We left the car at nine o'clock. The day was fair. A gentle easterly breeze was blowing and for the first time for twelve days the weather was distinctly summer-like, the thermometer on the street in Charleston at two o'clock registering 70 degrees.

Birds generally were not plentiful in the shrubbery, but overhead, flying northeast up the coast, were many flocks of small birds. Some flocks flying high could only be detected by the feeble calls of the birds, but other flocks were moving only a little above the land and could be identified as Myrtle Warblers by their call note. All flocks viewed at short range were seen to be composed entirely of this species. During our stay here of an hour there was a steady succession of warbler flocks flying up the coast, but only an occasional bird sought the shrubbery for rest or food.

A broad tidal stream separates the southwest end of Long Island from Sullivan Island, which is a similar sand bar trending in the same direction, and forming practically a continuation of the former island. The complex chaparral of Long Island disappears almost completely upon crossing the tidal stream and a miniature forest of wax myrtle trees (*Myrica cerifera*) takes its place, while the sand dunes become much less pronounced. Here a great change in the behavior of the birds was observable. Myrtle Warblers swarmed everywhere feeding at times but working up the coast slowly. There were warblers on the outer beach close to the water; on the shingle beaches and on their accompanying patches of seaweed. Every shrub and tree had one or more birds searching for myrtle berries of which there were scarcely any in this immediate vicinity. They alighted on and flew beneath the piers of the oyster fishermen; clambered over piles of oyster shells;

searched the inside and outside of fishing boats lying on the shore; inspected the chimneys and the sides of the fishermen's houses; looked over the weather-beaten fences and visited the marshes, a veritable host of inquisitive and, I believe, hungry birds bound for the North and feeding as they went and in this army there was no other kind of bird whatever.

As a rule the growth of their nuptial plumage was insufficiently advanced readily to identify the sexes. All the birds still wore their winter coats. As far as could be detected without the bird in the hand, there was no other indication of their summer plumage except that the yellow patch opposite the bend of the wing appeared slightly more apparent than during midwinter.

Perhaps half a mile from the northeast end of Sullivan Island the belt of wax myrtle trees narrows to a width, measured northwest and southeast, of about three hundred feet. Here, near a seashore resort, a road had been recently cut across the belt of wax myrtle trees at right angles to the sand bar. Streams of warblers flying along the shore northeasterly from Folly and Morris Islands, just south of the entrance to Charleston harbor, dropped to the land and converged at the southwest end of the mantle of myrtle trees and passed across the open swath cut for the new road. Posting ourselves here we counted the birds moving northeast, minute by minute as they passed the opening, for half an hour. The flight was continuous, many of the birds lighting on the ground and trees from time to time, and the number crossing per minute varied from twenty to two hundred, and accordingly averaged about one hundred per minute. As far as we could judge the number was no greater than it had been all the time since our arrival at the shore. Taking, therfore, the average at one hundred per minute, 24,000 Myrtle Warblers passed northward between nine in the morning and one in the afternoon. Not only so, but additional warblers passed close by both to the east and to the west of the stream of birds under observation. No doubt also the migration began prior to nine in the morning and did not cease at one in the afternoon. The line of migration passed directly across Charleston harbor entrance, there being no tendency for the birds to follow the shore line of the deep harbor reëntrant. This course is mentioned because it is believed to be a practice fol-

lowed quite generally as the birds move northeast and helps to explain certain anomalous dates of arrival at northern stations during the spring migration,

Where did all these warblers come from, and in what manner did so large a concentration take place? Is it customary for Myrtle Warblers to migrate northward earlier along the Atlantic seacoast than close by in the interior, as was the case on March 4, 1920, and, if so, how far in terms of date of arrival does such migration keep in advance of interior-moving birds? My own observations west and southwest of Charleston, above cited, make it fairly certain that the winter home of the warblers lay either in Florida or in some or all of the countries comprising the most southern portion of their range. I have been unable to find any published record of Myrtle Warblers, wintering in the United States, assembling in this manner and I have never before observed them in large numbers migrating northward without admixtures of other species of warblers or members of other families.

Published records show that late in February and early March Myrtle Warblers in numbers begin to arrive from tropical countries at Alligator Reef and Sombrero Key lighthouses in Florida; but among reports to me for the current year (1920) from lighthouse keepers at Sombrero Key, Dry Tortugas, American Shoal and Sand Key, only at the last mentioned station were any migrating birds of any kind observed prior to March 4, 1920. At Sand Key light-house, however, the keeper, Mr. C. G. Johnson, reports that the "Migration began on the night of February 8, when a great many land birds," referred to as "warblers and sparrows," passed the light. Mr. Johnson reports other large flocks of small birds passing this light going northward on February 13, 17, 24, 27, and on March 1. The movement on February 8, 13, and 27, and March 1, took place at night and on February 17 and 24, during daylight. Accurate information as to the names of the species of warblers composing these flocks is unfortunately lacking, but the arrivals noted correspond fairly closely in the matter of time with prior flights which are known to have included many Myrtle Warblers. That most of the warblers arriving in Florida from across the Gulf of Mexico at this season of the year may be safely regarded as of this species receives additional support from the

fact that the records show that but one or two other species of warblers reach Florida from the Tropics before March 1, and these in small numbers only. My own observations in Georgia and South Carolina during February and March, 1920, and throughout the peninsular portion of Florida during the corresponding period for several previous years, indirectly furnish probable if not confirmatory support of the contention that the assembling of such a multitude of Myrtle Warblers, wintering in these states, if of actual occurrence, is an unusual phenomenon. Summed up, the evidence tends to substantiate the view that among the birds from across the Gulf of Mexico arriving in Florida during the twenty-five days immediately prior to March 4, 1920, there were many Myrtle Warblers.

It thus appears reasonably certain that the greater part of this army of warblers arrived in southern Florida from Cuba, Jamaica or Central America during February and March, accompanied by few or no other species of warblers, in a succession of smaller flights. If I were to view this matter from my own experience, the island of Cuba would have to be excluded as a possible source, for during November and part of December, 1917, I was much afield in Havana, Santa Clara and Oriente Provinces and my notes make no mention of seeing a single Myrtle Warbler among the thirteen species of warblers found there. In Florida insect food in sufficient variety and abundance awaited their coming, the birds, however, probably worked northward along the east coast to the first area of wax myrtle, bearing fruit in quantity. Here the concentration observed is believed to have taken place because here their favorite vegetable food occurred in such abundance as to satisfy their needs. The supply of berries becoming exhausted at this locality, the birds again moved northward until a like area was encountered, the route taken being the main belt of myrtle bushes which closely follows the outer sand bars and sea beaches along northeastern Florida. The vegetable food supply thus influenced their migration speed, and its distribution determined the route followed; and this migration thus far north in Florida was in the main independent of local temperature excepting that on warm days like the fourth of March, coming after a period of unusually cool weather for the time of the year, the northward movement would no doubt be temporarily accelerated.

Along the entire coast of eastern Florida, part of Georgia, most of South Carolina, nearly the entire coasts of North Carolina, and Virginia, Maryland and Delaware, all of New Jersey (bordering the ocean) to Sandy Hook, the south shore of Long Island and much of Massachusetts to Maine, outer sand bars occur, separated from the mainland by narrow bodies of shallow water or salt marshes. These sand bars are often intersected by great arms of the sea like Chesapeake, Delaware and New York Bays. Many estuaries open through them, such as Port Royal Sound and Savannah Harbor. From eastern central Florida north to Maryland, following this long line of sand bars, two species of Myrica, bearing wax-covered seeds, reach their maximum development; and, as one goes inland, they decrease rapidly and practically disappear a short distance from the ocean or as high land is reached. The northern species (*M. carolinensis*) occurs along the entire coast from Nova Scotia to Florida and the southern form (*M. cerifera*) ranges from southern New Jersey south to Florida, along the Gulf coast to Texas and up the Mississippi valley to Arkansas. It is believed that the adherence of the early, tropically-wintering Myrtle Warblers to this seaside belt of Myrica, with its accompanying food supply, aided perhaps by the greater average warmth of this belt during such migration as compared with interior regions having the same latitude and much higher elevation, accounts for their arrival at certain places in New Brunswick and Prince Edward Island, near the coast, earlier than at more inland points well to the southwest, and it appears to be more than a coincidence that the northern limit of *Myrica carolinensis* is found in these two northern provinces where, in the case of Prince Edward Island, Myrtle Warblers on the average arrive April 26, thirteen days ahead of eleven other species of warblers, and nearly a week earlier than at certain Pennsylvania stations, below referred to, 600 miles to the southwest. Thus these birds are reported by W. W. Cooke (see Bulletin No. 18, U. S. Biological Survey, pp. 62 and 63) as arriving in New Brunswick a week earlier than at Philadelphia and Renovo, Pa., and at certain places in New Jersey (not specified). Philadelphia is located on the Delaware River just above sea level, about seventy-five miles from the ocean end of Delaware Bay, and fifty miles from the eastern coastal sand bars

along the New Jersey coast followed by the early migrants. Renovo lies on the Susquehanna River still further inland on the north side of the Appalachian Range and at a considerable elevation. It is reasonable to believe that the birds so reported reach these interior stations as part of the general, mixed, inland warbler movement of a later date. The state of New York affords a similar set of conditions by which to test this belief and fortunately fairly conclusive data bearing on the matter have been assembled by Eaton (see Birds of New York, Part 1, "County Schedules" tabulations). Eaton shows by the testimony of competent observers that this species reaches northern, central and western New York several days later than it is reported at nearly all coastal stations in this state.[1]

Mention has been made of the fact that the warblers moving northeast on March 4, did not follow the sinuosities of the shore line into Charleston harbor but cut straight across its entrance to other sand bars lying to the northward, and it is believed that this practice is adhered to all the way up the coast, at least as far as New England, the birds moving similarly across the entrance to other like waterways such as Chesapeake Bay, Delaware Bay (thus failing to reach Philadelphia seventy-five miles to the north) and the big reëntrant south and east of New York City, from Sandy Hook in New Jersey to the western end of Long Island, where they first appear from April 1 to 10. Staten Island, which lies at the extreme western end of Lower New York Bay, is passed by, the earliest date recorded for spring migrants here being April 22 (see Eaton's County Schedules referred to above).

The Atlantic seaboard is well known to be a wide and favorite route followed more or less closely by many species of birds in

[1] There is one exception noted. Two observers furnished the migration notes from Tioga county and the "County Schedules" give two dates, March 30, as the earliest date and April 28 as the average date of first arrivals of Myrtle Warblers. Tioga county is one of an east and west tier of counties, forming the southern boundary of the state, adjoining Pennsylvania. The earliest dates for first arrivals in the counties adjoining Tioga county are April 23 (Broome county), April 24 (Chemung county), and April 10 to April 29 for the remaining counties. It is thus seen that March 30 is a very exceptional date for this section of the state and extremely local. I have been unable to secure full particulars of the occurrence of this warbler in Tioga county on March 30 or the year or years the observations were made. Wintering birds on Long Island may well have accidentally wandered there or have been blown westward by a powerful easterly wind.

their spring and fall migrations. During March an extremely narrow portion of this zone, namely the belt of sand bars lying next the ocean, appears to constitute an early migration highway for Myrtle Warblers (independent of interior migrating birds) which have wintered in the Tropics.

If it be true that these warblers came from tropical winter quarters, then the migrating instinct, no doubt preceded by physiological changes, developed earlier among birds that wintered under conditions of great humidity and high temperature than among those wintering in the cooler United States; and I have given temperature conditions during February for the three southern Atlantic states with comments on the behavior of the Myrtle Warblers wintering in Georgia and South Carolina to emphasize this fact and to contrast the absence of any observable migrating tendency among these birds wintering even thirty miles from the ocean near Charleston at a time when a host of the same species was moving by them northward along the coast.

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PROBLEMS OF FIELD IDENTIFICATION.[1]

BY LUDLOW GRISCOM.

AT a meeting of the Linnaean Society of New York when a school boy, I reported having seen a Bicknell's Thrush, my indentification being based on the erroneous supposition that its call-note was diagnostic. The resultant storm of criticism rendered me practically speechless. Then and there I planned to do my best to become a reliable observer and to investigate the scientific possibilities of sight identifications. So little did I have to say at that Linnaean Society meeting that my credibility was entirely eliminated, and for over two years nothing I reported was given any credence or entered in the proceedings. In the years that

[1] Read before the thirty-ninth Meeting of the A. O. U. at Philadelphia November 10, 1921.

have passed no event hurt more or was more beneficial. I can claim, then, a full understanding of and sympathy for the amateur bird student and his point of view. Recently I have been forced at times into the position of judging or criticising other people's records. This has given me the opportunity of learning the point of view of the trained naturalist, who is responsible for the scientific accuracy of what he publishes.

It is a waste of time to discuss the importance and necessity of sight identifications when it comes to studying habits, life-histories, migration, and local or detailed distribution. Here where we are dealing with the usual and the average, the normal rather than the exceptional, one record can check another. The cumulative value of the data collected under these heads by amateur students all over the country is too well known and obvious to require elaboration. Yet before I pass on to my main theme I should like to express my own sense of indebtedness to these bird lovers, who make no claim to being scientific ornithologists, but without whom our knowledge of American birds could not have reached its present development. My reason for wishing to make this acknowledgment of their assistance as full and complete as possible is that I am going to attempt to show that, by the very nature of the laws of evidence, this same help cannot be extended by the amateur observer to so great an extent in the determination of the abnormal and exceptional. The failure to recognize this distinction is, I believe, the cause of the only point of friction that disturbs the good relations between the professional and amateur in our subject; for the only phase that presents any real difficulty to harassed editors, or which causes hard feelings in the bosom of the amateur, is when an unprofessional or untrained observer reports the occurrence of rare, unusual or accidental birds in some local area, and it becomes incumbent upon the reviewer to determine the scientific value of this testimony. Just how difficult and disagreeable a task this can be is, perhaps, only known to those who have experienced it, and who receive angry or insulting letters.

What birds *can* be satisfactorily identified in the field? When is a sight record of scientific value?

It is to be noticed that these are two distinct questions. The first can be answered by considering only the diagnostic characters

of the bird, the second involves also the characteristics of the observer. To take a specific parallel from another field, our first question asks whether typhoid or measles can be identified without killing the patient and performing an autopsy. The second asks under what conditions a diagnosis of these diseases shall be taken as establishing their presence as a scientific fact.

Let us take these two questions in order, considering first the possibilities in sight identification. They are very much greater than many people suppose, greater I believe, than even many professional ornithologists believe, if they have not specialized in field observation. To the beginner sparrows look pretty much alike, but the Vesper is picked out by having white outer tail-feathers. No one who knows all the sparrows well bothers to identify a Vesper sparrow in this way. The pattern of its back is distinctive, and the color effect of the side of the head is diagnostic. Comparatively few people in identifying a Jay need to see its crest or its blue color. In fact bird-books mention only the most conspicuous characters of our birds.

I have drawn up for consideration two lists, one of birds which it is practically impossible to distinguish in life, the second of birds which trained field ornithologists find very difficult to distinguish satisfactorily. These lists represent not only my own opinion but also the opinions of trained field ornithologists with whom I have had the privilege of association in the field. The territory included is the eastern United States. Accidental visitants and subspecies are omitted from consideration, but this does not mean that they are of necessity unidentifiable.

The list of practically impossible birds follows:—Immature Forster's, Arctic, and Common Terns; females of the two Widgeon and the two Golden-eyes; the two Scaups; immature American and King Eiders; males of the larger species of *Accipiter* compared with females of the sm ller species; non-breeding Alder and Acadian Flycatchers; immature Blackpoll and Baybreasted Warblers. These are birds for which I have never been able to discover a reliable diagnostic field character.

With the exceptions above noted, in my opinion it is *possible* to identify every species of bird in the Eastern United States in life in any of its plumages. By "possible" is meant that the bird in

question possesses a character of color, size, or voice which is observable under such conditions of light, proximity, or direct comparison as the particular case may require. It follows, therefore, that a possible identification might be very difficult but never wholly improbable. The list of birds that unquestionably belong in the very difficult class follows:—Immature Parasitic and Long-tailed Jaegers; Ring-billed Gull; adult Forster's, Arctic, and Common Terns; adults of the two Cormorants; female and immature American and Red-breasted Mergansers; female Ring necked Ducks; Snowy Egret and immature Little Blue Heron; the immature Night Herons; Semipalmated and Western Sandpipers; the two Yellowlegs; immature *Buteos*; breeding Alder and Acadian Flycatchers; Fish Crow in midsummer; Bronzed Grackle; the Sharp-tailed Sparrows.

As a general principle these birds can only be identified by trained ornithologists under very favorable circumstances. In any locality where they would be rare or casual, they should be automatically transferred to list 1. To avoid argument it may be stated that a bird is listed as difficult to identify if the diagnostic character is only occasionally noticeable. Thus the Alder Flycatcher is easy to identify if it sings, but as a migrant it usually does not. The Ring-billed Gull is easy to identify if you see the color of its legs, but usually you cannot get near enough. As neither of these events is wholly improbable, identifying either species is a perfectly good possibility. In birds of list 1, however, it is wholly improbable that a sufficiently near approach to see the diagnostic character could possibly be made. It is also obvious that the more inexpert the observer, the more birds become difficult to identify.

With this brief discussion of the possibilities in sight identification we can turn to our second question, a much less popular theme. To mention two minor points first. The notes of the Starling require us to be more careful in listing as heard certain native species which it mimics. Mute Swans having become feral in several sections of the New York region, renders all Swans unidentifiable except under most improbable circumstances, and in this connection I see that the Mute Swans on the Hudson River near Staatsburg have finally burst into print in the last 'Auk,' as Whistling Swans

though such an identification has been successfully suppressed on several occasions.

With the exceptions already noted it may be confidently asserted that all so-called difficulties or inaccuracies of identification and the doubting of records by ornithologists are due to the defects of the individual student and not the bird. These defects are divisible into four catagories.

(a) Physical defects of eye and ear.

(b) Natural inaptitude for the study. The best illustration of what I mean by this is a woman who was constantly seeing the Prothonotary Warbler in Central Park in New York City without gaining credence. Even after this strikingly attired Warbler had actually occurred in the Park, and she had seen the genuine article daily for a week, she pointed out a female Scarlet Tanager and a Yellow-throated Vireo on two subsequent occasions as Prothonotary Warblers.

(c) Mental attitude of the observer. By this I mean, in part, list-crazy enthusiasts, whose one idea is to get as large a daily, monthly, or yearly list as possible, and whose greatest happiness is to add some rare or casual visitant to their list. As this attitude is neither ornithological nor scientific, their observations are unavoidably open to suspicion.

(d) Ignorance and lack of study. This is by far the most important and wide-spread defect. It causes 99 per cent. of the misidentifications of bird-students, and is responsible for 99 per cent. of the difficulty which professional ornithologists have in that most unwelcome task, judging the sight records of others. No one can be blamed for physical defects or natural inaptitude for a given subject, and it would be absurd narrow-mindedness to expect every one interested in birds to have a scientific attitude of mind, but if the student wants to make scientific records by sight identification, ignorance of his subject and an unscientific mental attitude cannot possibly be condoned, and will render such records liable to suspicion. A recent illustration of this may serve to clarify the principle involved. The Willet is by no means rare on Long Island in fall, but is excessively rare in spring. A very enthusiastic bird-student called me up, and mentioned as a very fine find a Willet seen in August. "Of course," said he, "the Willet is a

regular spring migrant, but I never saw one in the fall before." When asked for his spring observations, he said he would have to look them up, as they had not made much impression on his mind. In spite of the fact that the Willet is one of the easiest shore-birds to identify correctly, the committee now preparing a New York local avifuana would, naturally, be entirely unjustified in foisting such records on the literature of ornithology, and it would surprise me if any one but the observer himself would disapprove of this ruling.

Enough has already been said under limitations to indicate that the difficulty in judging sight records lies almost entirely in the human equation. "Lack of study" is a purely relative matter, and knowledge of a subject can vary from 0 to 100 per cent. The principle underlying the whole question is roughly as follows. The correctness of a sight identification rests upon the unsupported testimony of the observer and is an opinion of his. The weight of this opinion cannot have a higher percentage rating, than his knowledge of the subject has to complete knowledge. That is, if he only knows 80 per cent. of the facts bearing on the particular case, his opinion cannot possibly have a weight greater than 80 per cent. This is merely applying to ornithology the rule of logic that any conclusion is worth only what the facts on which it is based are worth. Except under very exceptional circumstances an opinion must be worth approximately 100 per cent to be of definite scientific value, and the "human equation" reduced as near to zero as possible. The scope of an exact science is increased by facts, not by probabilities. The only factor modifying this principle is what may be termed the relative identifiability of the bird. An adult male Scarlet Tanager, a Pelican, or a Chicken are so easily identified that the "human equation" is automatically greatly reduced and the value of the opinion greatly increased. The more difficult the identification of the bird, the more the "human equation" counts.

Perhaps it might interest many bird students to take up the point of view of the scientist, who has to pass on the validity of sight records, and see what he has got to have in the way of information to solve this problem of the "human equation." Let us return to our simile of the doctor. You have a severe pain in

your insides, the doctor arrives and listens to your symptoms. Suppose he is quite non-plussed, never heard of such symptoms before, goes home, scrabbles through the standard medical works to learn how to tell symptoms of colic and appendicitis apart, and writes you confidently a day or two later that he has looked your symptoms up in all the text-books, that you undoubtedly have appendicitis and must be operated on immediately. If in addition he has no particular reputation as a diagnostician, and you discover that he never even graduated from a medical school you would not value his opinion, and you would most assuredly get another doctor. This story may serve to indicate some of the principles involved. The patient has a clear right to select his physician, to accept or reject the treatment. The editor or ornithological critic has not only a right but a duty to judge every sight record and his accepting one will be the result of exactly the same factors in principle, as the patient uses in trusting to a physician's diagnosis.

The scientific ornithologist must, therefore, ask himself an obvious question with regard to any sight record:—

What is the reputation of the observer for knowledge of the subject? This does not necessarily involve personal acquaintance with the observer. If he is known to be a trained field ornithologist the question is practically settled, the sight record will be accepted. If he has no reputation and is really entitled to one, he has only himself to blame. If he is not entitled to a reputation, it is his duty to pass satisfactorily on one or more of the following questions:—

(1) Is the observer thoroughly familiar with the birds of his locality? Was he aware of the importance of his observation?

(2) Did he ever see the bird before?

(3) Does he know the species with which it could be confused?

(4) Does his account show that the circumstances of the observation were thoroughly satisfactory?

(5) Did he recognize the bird at once, or did he have to look it up later?

Surely any fair-minded person could take no exception to the natural reasonableness of these questions. There is nothing harsh or hypercritical about them. It is equally obvious that as

more of them are satisfactorily answered, the value and probability of the identification steadily increase. It is also equally fair that if *none* of these questions is answered satisfactorily, the record should be rejected. As the ornithologist is responsible for the accuracy of what he publishes, it is *absolutely necessary* for him to reject any sight record of a bird known to be difficult to distinguish unless *every one* of these questions can be satisfactorily answered. And yet it is no exaggeration to state that the majority of records submitted for consideration do not afford the wretched editor a definite answer to a single one of these questions. Not only this, but an effort on the part of the editor to obtain answers to these questions frequently gives offense, and the written report of the observation frequently contains in itself an unfavorable answer to one or more of these questions. It is undoubtedly true that many valid observations are rejected annually, because the observer entirely fails to report them properly. His wrath at the editor could more appropriately be turned against himself. Again many bird-students have an idea that the record of the trained field ornithologist is readily accepted because his "word is good," and are annoyed that their "word is not good." This is absolutely incorrect. The record of the trained field ornithologist is almost invariably written up more carefully and more conscientiously than that of any other observer, he does not value "his word" at two cents, and the editor can answer every one of his questions favorably.

Failure to understand the reasonableness and justice of these questions which the editor asks himself, is proof positive that the mental attitude of the student is wrong, and that it is unscientific, which must always render his records liable to suspicion and subject to careful scrutiny. While on this subject I append in the form of little maxims, some other points founded on personal experience, which are indicative of an unscientific mental attitude. They do not apply to all bird students by any means, and are intended to be constructive rather than critical.

(1) Do not fail to recognize that the professional ornithologist knows more about the subject than you do.

(2) Do not tell a critic that you have studied birds for twenty-five years. You have not and he knows it. You have been interested in birds for twenty-five years, but you have studied them in a part of your spare time only.

(3) Do not try to argue yourself into a reputation as an expert. It is a matter of fact, not of argument. The professional must also be allowed some time to find it out. He has no psychic powers.

(4) Remember that the true ornithologist is pleased when another recruit joins the ranks. If he doubts your record, it is not because he is trying to down you, or to get rid of a dangerous rival.

(5) Unfavorable criticism, even if occasionally undeserved, is one of the best incentives to learning a subject well. The more you dislike it, the more likely you will be to take the steps necessary to make its repetition impossible. Merely getting hurt or sore will not help at all. If you are persistent, it will not discourage you. If you are not persistent, you cannot possibly become a trained field ornithologist anyhow.

The foregoing discussion has attempted to answer the question: "When is a sight record of scientific value?" If it is granted that the "human equation" is the chief difficulty involved, the fairness of the questions which the ornithologist, as editor or critic, asks himself about any given record, must also be granted. Of these it is obvious that the reputation of the observer for being a trained field ornithologist is the most important. If the bird student really wishes to make observations of scientific value, he must needs become a trained field ornithologist. Granted no physical defects and some aptitude for the study, this is well within the reach of anyone. Like every other art, it requires skill and knowledge, only to be attained by practice and study. This study should, of course, follow along definite lines, and I would suggest the following as necessary qualifications.

(1) First and most important, the student should learn *by heart* the published information on the birds of his locality. He should be able to give his "local list" from memory, and should know the status and seasonal occurrence of each species. This will teach him what to expect, and he will immediately recognize the abnormal or the unusual as such. If there be no published information, he should study the published information of all the territory adjacent to his.

(2) Next, commit the diagnostic characters of every species in the local list to memory. Get a mental image of what is to be

seen. Colored plates of practically every species of bird in North America are available to all. If possible, a museum should be visited and bird-skins examined. This is the best way of acquiring a clear mental picture.

(3) Next, get out in the field and learn to know the birds of your locality well. The length of time this will take is naturally a question of the amount of time available for field work, but ten years is a safe estimate. Most bird students waste a lot of time by starting to look for birds before they know anything about them, and as a result most of the first year or two is relatively profitless. It is perfectly possible to go south or west for the first time into a totally different avifauna, and recognize every species immediately.

(4) Above all, the student should cultivate the scientific attitude of mind, and he should never believe in his infallibility. The beginner's notebook is all question marks. The student who is beginning to know birds really well often has no question marks. The notebook of the trained ornithologist always has many question marks, until death closes the notebook.

The above constitute a minimum of requirements for a trained field ornithologist. Short of this his records must be examined most critically. To attain these qualifications calls for no special gifts or capabilities. The time required depends upon the time given. In fact, granted the goal, failure of attainment implies laziness and lack of interest. Some of the best field ornithologists this country has ever produced have been busy men absorbed in a totally different career, with whom ornithology has been purely a hobby.

Like any other study which is really worth while and productive of results, the genuine student will never be satisfied with the minimum. The pleasure of seeing a rare visitor or a total stranger in one's locality is increased if it can be recognized at once, it is doubly increased if it is an old acquaintance, seen previously somewhere else in its normal range. It is obvious therefore that an ever-increasing knowledge of North American birds and an ever-widening field experience can only add to the pleasure derived from the study as well as the scientific value of any given sight record. I do not want to close this paper on field ornithology, the subject which I love best in the world, on the harsh basis of

requirements and necessities. It is a trite aphorism that the enjoyment of a subject increases as our knowledge of it increases. So let us not think of requirements, but take the steps that will bring us the greatest possible enjoyment. One of the greatest advantages of field ornithology is that the more we know about it, the more we enjoy it, and the more we can benefit others. Its true student need never worry about criticism or incredulity.

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A CALENDAR OF BIRD MIGRATION.

BY NORMAN CRIDDLE.

In presenting the tables on bird migration given below a few explanations are necessary. To begin with, it must be realized that while all reasonable efforts have been made towards accuracy there are times when even the most careful observers fail to differentiate between closely allied species, and since collecting on a sufficiently wide scale is out of the question the determinations must be chiefly by sight. I believe there are very few errors in these records as a result of this method, but I wish to draw attention to the fact that very little attempt has been made to distinguish between geographical races excepting in a few cases when the habits of the birds involved can also be taken into account, but I have given the racial name when the evidence at hand indicates that it most probably applies to the bird reported. As an example all Meadowlarks, whether in song or not, are assumed to be *neglecta*, that being the dominant and probably the only race found in Manitoba, but the racial name must not be taken too literally.

These observations were made in the country at a place called Aweme in Manitoba, Lat. 49° 42′; Long. 99° 33′; they were commenced during the spring of 1895 and terminated in the fall of 1920, thus covering a period of 25 years. The country is semi-wooded but lacks surface water other than that supplied by the Assiniboine River some three miles away. The lack of water nea

at hand makes the calendar essentially one of land birds and this should be kept in mind when comparing records.

Observations of less than ten years show that the species is either rare or irregular in its appearance.

All species noted in less than five years have been omitted from the list.

The names given are those in use in the A. O. U. 'Check-List' of 1910 and since the list is mostly of local interest, the scientific names have been omitted to save space.

In conclusion I desire to acknowledge an indebtedness to my brothers Evelyn, Stuart and Talbot for furnishing me with many of the records from which these tables have been compiled.

SPRING MIGRATION 1895–1920

No. of years observed	Name of bird	Average date of first arrival	Earliest date of first arrival
25	Prairie Horned Lark	Feb. 21	Feb. 9, 1918
25	Crow	Mar. 22	Feb. 25, 1911
25	Red-tailed Hawk (also Western)	Mar. 23	Mar. 11, 1902
25	Tree Sparrow	Mar. 24	Mar. 12, 1914
18	Canada Goose	Mar. 26	Mar. 16, 1915
25	Marsh Hawk	Mar. 26	Mar. 11, 1902
8	Saskatchewan Horned Lark	Mar. 28	Mar. 17, 1914
25	Lapland Longspur	Mar. 29	Feb. 24, 1918
25	Slate-colored Junco	Mar. 30	Mar. 17, 1910
25	Western Meadowlark	Apr. 1	Mar. 21, 1911
21	Killdeer	Apr. 3	Mar. 23, 1910
18	Mallard	Apr. 3	Mar. 23, 1910
23	Rough-legged Hawk (sp.?)	Apr. 4	Mar. 11, 1910
20	Rusty Blackbird	Apr. 4	Mar. 23, 1910
25	Robin	Apr. 6	Mar. 23, 1907
5	Shufeldt's Junco	Apr. 6	Mar. 24, 1910
13	Scaup Duck (Lesser?)	Apr. 8	Apr. 2, 1906
24	Sparrow Hawk	Apr. 8	Mar. 17, 1905
24	Red-winged Blackbird	Apr. 9	Mar. 23, 1910
13	Long-eared Owl	Apr. 10	Mar. 28, 1920
11	Golden-eye	Apr. 10	Mar. 28, 1910
22	Sandhill Crane	Apr. 10	Apr. 6, 1905
25	Herring Gull	Apr. 11	Apr. 2, 1906
23	Chestnut-collared Longspur	Apr. 11	Mar. 24, 1911
11	Brewer's Blackbird	Apr. 11	Mar. 28, 1910

No. of years observed	Name of bird	Average date of first arrival	Earliest date of first arrival
12	Huchins' Goose?	Apr. 12	Apr. 2, 1906
10	Green-winged Teal	Apr. 13	Apr. 8, 1908
20	Sharp-shinned Hawk	Apr. 13	Mar. 28, 1911
25	Northern Flicker	Apr. 13	Mar. 30, 1918
25	Song Sparrow	Apr. 14	Apr. 5, 1910
8	Whooping Crane	Apr. 15	Apr. 9, 1901
10	Merganser	Apr. 16	Apr. 8, 1901
20	Bronzed Grackle	Apr. 16	Apr. 7, 1910
25	Western Vesper Sparrow	Apr. 18	Apr. 12, 1918
7	Bluebird	Apr. 18	Mar. 27, 1918
21	Fox Sparrow	Apr. 19	Apr. 9, 1919
20	Mourning Dove	Apr. 19	Apr. 9, 1910
22	Swainson's Hawk	Apr. 21	Apr. 5, 1913
8	Blue-winged Teal	Apr. 22	Apr. 10, 1911
20	White-fronted Goose	Apr. 22	Apr. 5, 1918
7	Shoveller	Apr. 22	Apr. 11, 1903
20	Snow Goose (i. e. Lesser)	Apr. 22	Apr. 5, 1913
6	Phoebe	Apr. 22	Apr. 17, 1916
19	Purple Finch	Apr. 23	Apr. 14, 1918
18	Sprague's Pipit	Apr. 23	Apr. 8, 1910
22	Myrtle Warbler	Apr. 24	Apr. 16, 1917
21	Ruby-crowned Kinglet	Apr. 25	Apr. 16, 1915
15	Greater Yellow-legs	Apr. 25	Apr. 10, 1903
21	Yellow-bellied Sapsucker	Apr. 25	Apr. 16, 1911
22	Franklin's Gull	Apr. 25	Apr. 21, 1903
17	Pipit	Apr. 26	Apr. 15, 1908
7	Long-billed Curlew	Apr. 26	Apr. 9, 1902
9	Bittern	Apr. 27	Apr. 14, 1915
5	Mountain Bluebird	Apr. 27	Apr. 14, 1920
18	Wilson's Snipe	Apr. 27	Apr. 14, 1915
25	Tree Swallow	Apr. 27	Apr. 21, 1911
22	White-throated Sparrow	Apr. 28	Apr. 18, 1915
22	Savanna Sparrow (Western?)	Apr. 28	Apr. 21, 1915
16	Belted Kingfisher	Apr. 28	Apr. 5, 1910
7	White Pelican	Apr. 29	Apr. 9, 1912
14	White-rumped Shrike	Apr. 30	Apr. 8, 1913
9	Blue Goose	May 1	Apr. 9, 1908
11	Swamp Sparrow	May 1	Apr. 9, 1912
20	Yellow-headed Blackbird	May 2	Apr. 21, 1903
19	Hermit Thrush	May 2	Apr. 19, 1917
10	Broad-winged Hawk	May 3	Apr. 8, 1906
24	Clay-colored Sparrow	May 4	Apr. 24, 1901
18	Golden Plover	May 4	Apr. 28, 1911

No. of year observed	Name of bird	Average date of first arrival	Earliest date of first arrival
22	Upland Plover	May 5	Apr. 30, 1901
23	Cowbird	May 5	Apr. 23, 1908
5	Smith's Longspur	May 6	Apr. 30, 1913
15	Chipping Sparrow	May 7	May 2, 1911
20	Palm Warbler	May 8	Apr. 30, 1915
21	Orange-crowned Warbler	May 8	Apr. 30, 1903
19	Black and White Warbler	May 8	Apr. 30, 1901
17	White-crowned Sparrow	May 8	Apr. 29, 1913
25	Harris's Sparrow	May 8	May 3, 1915
10	Spotted Sandpiper	May 9	Apr. 25, 1915
9	Black-throated Green Warbler	May 9	Apr. 30, 1915
24	Brown Thrasher	May 9	May 2, 1901
12	Lincoln's Sparrow	May 9	Apr. 25, 1911
15	Sora	May 10	May 1, 1901
21	Least Flycatcher	May 10	May 1, 1901
17	Barn Swallow	May 12	May 2, 1912
18	Gray-checked Thrush	May 13	May 5, 1914
7	Olive-backed Thrush	May 13	May 8, 1902
25	Whip-poor-will	May 13	May 1, 1901
24	Western House Wren	May 13	May 3, 1911
8	Cliff Swallow	May 13	May 2, 1912
21	Black-poll Warbler	May 14	May 9, 1902
11	Purple Martin	May 14	May 8, 1910
23	Bank Swallow	May 14	Apr. 28, 1911
16	Grinell's Water-Thrush	May 14	May 4, 1914
23	Ovenbird	May 14	May 8, 1914
19	Tennessee Warbler	May 14	May 9, 1920
23	Yellow Warbler	May 14	Apr. 30, 1897
20	Blue-headed Vireo	May 14	May 5, 1914
21	Towhee	May 14	Apr. 30, 1903
19	Lark Sparrow (race?)	May 14	May 6, 1920
22	Bobolink	May 15	May 3, 1902
24	Redstart	May 15	May 11, 1903
7	Pine Warbler	May 15	Apr. 15, 1901
15	Pine Siskin	May 16	May 2, 1911
14	Rose-breasted Grosbeak	May 16	May 12, 1902
25	Black Tern	May 16	May 13, 1902
21	Kingbird	May 16	May 10, 1903
21	Willow Thrush	May 17	May 11, 1903
23	Baltimore Oriole	May 18	May 11, 1911
21	Wilson's Warbler	May 18	May 11, 1903
20	Magnolia Warbler	May 18	May 11, 1913
11	Olive-sided Flycatcher	May 18	May 9, 1910

No. of years observed	Name of bird	Average date of first arrival	Earliest date of first arrival
6	Cape-May Warbler	May 19	May 16, 1913
25	Nighthawk	May 19	May 15, 1915
25	Goldfinch	May 19	May 10, 1910
5	Philadelphia Vireo	May 19	May 14, 1913
15	Warbling Vireo	May 20	May 15, 1911
25	Catbird	May 20	May 12, 1912
25	Red-eyed Vireo	May 21	May 15, 1901
10	Crested Flycatcher	May 22	May 14, 1912
13	Ruby-throated Hummingbird	May 24	May 17, 1915
20	Northern Yellow-throat	May 24	May 19, 1909
9	Chestnut-sided Warbler	May 25	May 18, 1914
9	Bay-breasted Warbler	May 26	May 16, 1911
8	Wood Pewee	May 26	May 20, 1909
6	Lark Bunting	May 26	May 18, 1911
5	Connecticut Warbler	May 27	May 18, 1903
9	Canada Warbler	May 28	May 18, 1903
25	Cedar Waxwing	May 29	May 21, 1901
15	Western Wood Pewee	May 30	May 25, 1901
20	Black-billed Cuckoo	May 30	May 21, 1901
11	Mourning Warbler	June 3	May 20, 1904

FALL MIGRATION

No. of years observed	Name of bird	Average date of last observed	Latest date of last observed
15	Black Tern	Aug. 9	Aug. 17, 1920
22	Franklin's Gull	Aug. 10	Aug. 19, 1907
23	Bank Swallow	Aug. 24	Aug. 29, 1913
9	Cliff Swallow	Aug. 28	Sep. 14, 1920
11	Canada Warbler	Aug. 28	Sep. 4, 1914
11	Mourning Warbler	Aug. 29	Sep. 5, 1909
8	Cape May Warbler	Aug. 30	Sep. 12, 1915
8	Connecticut Warbler	Aug. 30	Sep. 3, 1913
21	Baltimore Oriole	Aug. 30	Sep. 5, 1917
10	Olive-sided Flycatcher	Aug. 30	Sep. 20, 1908
14	Warbling Vireo	Aug. 31	Sep. 19, 1910
9	Chestnut-sided Warbler	Sep. 1	Sep. 20, 1911
19	Black-billed Cuckoo	Sep. 2	Sep. 14, 1907
7	Western Wood Pewee	Sep. 2	Sep. 13, 1902
17	Ruby-throated Hummingbird	Sep. 3	Sep. 11, 1910
12	Bay-breasted Warbler	Sep. 3	Sep. 16, 1907
17	Willow Thrush	Sep. 3	Sep. 12, 1915

No. of years observed	Name of bird	Average date of last observed	Latest date of last observed
22	Yellow Warbler	Sep. 4	Sep. 9, 1907
16	Magnolia Warbler	Sep. 4	Sep. 17, 1907
5	Black-throated Green Warb.	Sep. 5	Sep. 13, 1917
23	Rose-breasted Grosbeak	Sep. 5	Sep. 19, 1907
19	Wilson's Warbler	Sep. 6	Sep. 21, 1911
21	Upland Plover	Sep. 6	Sep. 18, 1907
16	Crested Flycatcher	Sep. 7	Sep. 20, 1908
23	Kingbird	Sep. 8	Sep. 17, 1917
16	Tree Swallow	Sep. 9	Oct. 7, 1920
19	Black and White Warbler	Sep. 9	Sep. 19, 1918
15	Black-poll Warbler	Sep. 9	Sep. 15, 1912
24	Nighthawk	Sep. 10	Sep. 24, 1917
12	Sora	Sep. 11	Oct. 3, 1907
13	Pine Warbler	Sep. 11	Sep. 25, 1907
16	Grinnell's Water-Thrush	Sep. 12	Sep. 29, 1918
17	Spotted Sandpiper	Sep. 14	Oct. 7, 1908
20	Gray-cheeked Thrush	Sep. 14	Sep. 27, 1915
11	Bobolink	Sep. 14	Sep. 20, 1910
21	Red-eyed Vireo	Sep. 14	Sep. 23, 1913
21	Ovenbird	Sep. 15	Sep. 28, 1912
21	Least Flycatcher	Sep. 15	Sep. 25, 1918
14	Barn Swallow	Sep. 16	Sep. 27, 1920
17	Northern Yellow-throat	Sep. 17	Sep. 26, 1913
23	Brown Thrasher	Sep. 17	Sep. 24, 1909
19	Redstart	Sep. 18	Sep. 28, 1920
12	Towhee	Sep. 18	Sep. 29, 1920
22	Catbird	Sep. 19	Sep. 29, 1908
7	Yellow-headed Blackbird	Sep. 21	Oct. 20, 1911
20	Duck Hawk	Sep. 21	Oct. 18, 1915
14	Chipping Sparrow	Sep. 22	Oct. 4, 1920
23	Clay-colored Sparrow	Sep. 22	Oct. 1, 1918
17	Tennessee Warbler	Sep. 24	Oct. 3, 1914
23	House Wren (Western?)	Sep. 24	Oct. 1, 1913
18	Swainson's Hawk	Sep. 25	Oct. 3, 1920
16	Orange-crowned Warbler	Sep. 27	Oct. 10, 1918
20	Killdeer	Sep. 29	Oct. 9, 1911
19	Yellow-bellied Sapsucker	Sep. 30	Oct. 10, 1910
21	Purple Finch	Oct. 2	Oct. 10, 1909
13	Sprague's Pipit	Oct. 2	Oct. 4, 1920
24	Chestnut-collared Longspur	Oct. 3	Oct. 12, 1914
18	Swamp Sparrow	Oct. 4	Oct. 10, 1911
12	Belted Kingfisher	Oct. 5	Oct. 12, 1911
17	Hermit Thrush	Oct. 6	Oct. 15, 1917

No. of years observed	Name of bird	Average date of last observed	Latest date of last observed
9	Mountain Bluebird	Oct. 7	Oct. 16, 1900
10	Savannah Sparrow (Western?)	Oct. 8	Oct. 14, 1911
10	Bluebird	Oct. 10	Nov. 1, 1911
19	Sparrow Hawk	Oct. 10	Oct. 20, 1908
23	Western Vesper Sparrow	Oct. 10	Oct. 15, 1909
23	Northern Flicker	Oct. 10	Oct. 18, 1907
23	White-throated Sparrow	Oct. 11	Oct. 23, 1907
19	Sharp-shinned Hawk	Oct. 11	Oct. 19, 1910
21	Mourning Dove	Oct. 12	Nov. 12, 1913
15	Sandhill Crane	Oct. 13	Oct. 31, 1900
22	Song Sparrow	Oct. 15	Oct. 22, 1907
22	Goldfinch	Oct. 16	Nov. 7, 1909
11	Lincoln's Sparrow	Oct. 17	Oct. 27, 1913
24	Crow	Oct. 18	Nov.
18	Wilson's Snipe	Oct. 20	Nov. 15, 1912
20	Red-tailed Hawk	Oct. 23	Oct. 30, 1901
23	Western Meadowlark	Oct. 24	Nov. 6, 1900
19	Red-winged Blackbird	Oct. 24	Oct. 28, 1908
15	Bronzed Grackle	Oct. 25	Nov. 8, 1901
7	Bittern	Oct. 25	Nov. 6, 1918
14	Pine Siskin	Oct. 26	Nov. 10, 1909
18	Rough-legged Hawk (sp.?)	Oct. 28	Nov. 5, 1904
23	Robin	Oct. 29	Nov. 13, 1910
21	Marsh Hawk	Oct. 30	Nov. 8, 1911
24	Slate-colored Junco	Nov. 4	Nov. 12, 1914
5	Green-winged Teal	Nov. 5	Nov. 9, 1915
5	Golden-eye	Nov. 5	Nov. 10, 1905
5	Blue-winged Teal	Nov. 6	Nov. 11, 1908
21	Rusty Blackbird	Nov. 7	Nov. 14, 1914
19	Scaup Duck (Lesser?)	Nov. 9	Nov. 17, 1912
23	Canada Goose	Nov. 13	Nov. 25, 1904
21	Mallard	Nov. 13	Nov. 21, 1901
24	Prairie Horned Lark	Nov. 14	Nov. 23, 1917

ARRIVALS FROM THE NORTH

No. of years observed	Name of bird	Average date first observed	Earliest date observed	No. of years observed	Average date last observed	Latest date observed
10	Great Yellow-legs	Aug. 8	July. 27, 1900	6	Sep. 26	Nov. 5, 1909
9	Red-breasted Nuthatch	Aug. 24	Aug. 12, 1910	9	Oct. 7	Oct. 17, 1907
12	Blue-headed Vireo	Aug. 26	Aug. 21, 1908	12	Sep. 8	Sep. 20, 1905
14	Golden Plover	Aug. 30	Aug. 6, 1901	12	Oct. 5	Oct. 16, 1897
15	Ruby-crowned Kinglet	Sep. 5	Aug. 24, 1915	15	Oct. 7	Oct. 14, 1904
22	Lapland Longspur	Sep. 6	Aug. 24, 1907	21	Nov. 16	Dec. 31, 1913
22	Myrtle Warbler	Sep. 12	Aug. 24, 1915	22	Oct. 10	Oct. 20, 1909
21	Pipit	Sep. 11	Sep. 2, 1905	20	Oct. 15	Oct. 28, 1914
14	Palm Warbler	Sep. 17	Sep. 2, 1913	13	Oct. 5	Oct. 7, 1908
22	Harris's Sparrow	Sep. 19	Sep. 10, 1912	22	Oct. 9	Oct. 20, 1917
9	White-crowned Sparrow	Sep. 22	Sep. 10, 1911	8	Oct. 2	Oct. 17, 1912
11	Fox Sparrow	Sep. 23	Sep. 12, 1914	8	Oct. 9	Oct. 20, 1917
21	Tree Sparrow	Sep. 26	Sep. 9, 1901	20	Nov. 6	Nov. 15, 1900
14	White-fronted Goose	Oct. 2	Sep. 7, 1902	14	Oct. 18	Nov. 1, 1920
18	Huchins' Goose	Oct. 4	Sep. 13, 1914	16	Oct. 16	Nov. 20, 1912
12	Golden-crowned Kinglet	Oct. 10	Sep. 25, 1912			
21	Snow Bunting	Oct. 11	Sep. 24, 1914	19	Apr. 30	May 23, 1918
18	Red-poll	Oct. 11	Oct. 2, 1913	13	Apr. 21	May 27, 1907
19	Northern Shrike	Oct. 12	Sep. 27, 1898			
21	Lesser Snow Goose	Oct. 13	Sep. 24, 1901	19	Oct. 20	Oct. 31, 1900
9	Blue Goose	Oct. 13	Sep. 12, 1902	8	Oct. 19	Oct. 24, 1908
14	Snowy Owl	Oct. 20	Sep. 26, 1896	2	Apr. 26	May 2, 1917
13	Evening Grosbeak	Oct. 27	Oct. 12, 1913			
17	Pine Grosbeak	Oct. 30	Oct. 10, 1902	3	Mar. 17	Mar. 30
9	Bohemian Waxwing	Nov. 4	Oct. 20, 1903	3	Apr. 3	Apr. 19, 1920

NOTES

HUCHINS' GOOSE.—Following Macoun's 'Catalogue of Canadian Birds' I have applied the above name to the small goose, superficially resembling *canadensis*, which is met with during migration in Manitoba. It averages five and a half pounds in weight as against ten pounds in the Canada Goose and measures about 28 inches in length. Its notes are much shriller than those of *canadensis*.

SANDHILL CRANE.—Doubtless records of the Little Brown Crane are mixed with these but specimens collected all appear to belong to the larger species as they weighed twelve or more pounds.

RED-TAILED HAWK.—Two races occur in Manitoba but I have not been able to distinguish them in flight.

ROUGH-LEGGED HAWK.—I have included both *lagopus sancti-johannis* and *ferrugineus* under this name being unable to accurately separate them in migration. The latter breeds in the vicinity.

Prairie Horned Larks and Lapland Longspurs occasionally remain throughout the winter. There are two distinct migratory periods of the latter, indicating that two races are involved.

In the fall migration records birds known to be, or suspected of being belated due to lack of migratory instinct have been omitted.

Treesbank, Manitoba

SEXUAL SELECTION AND BIRD SONG.

BY CHAUNCEY J. HAWKINS.

IN an article I wrote for 'The Auk' for October, 1918, on 'Sexual Selection and Bird Song,' the objection was raised against my position that, while my argument made "it seem very probable that bird-song had its origin—its first cause—in the 'maleness' of the males," I failed to show how "the multiplicity of songs of the various species of birds, the extremely elaborate songs of some, could have acquired their present forms except by some continuous selective process." The criticism was perfectly just and my only reply to it is that in the article I was not dealing with this phase of the question. If I succeeded in establishing the fact that bird-song had its origin in the maleness of the males, I feel confident that I laid the foundation for a more reasonable theory of how bird-songs, with their great variety, acquired their present forms than is found in the commonly accepted sexual selection theory.

The entire discussion of this complex problem rests upon a question which I have never seen adequately treated in connection with the sexual selection theory of the origin of bird-songs, namely, whether the evolution of subspecies, varying from the species type, was made from a single individual or from a number of individuals? Upon the settlement of this question rests the truth or the fallacy of the claims of those who have supported the sexual selection theory. If the variation which has resulted in subspecies has come from a single individual then there is a background of fact upon which the Darwinian disciples may build, but if the subspecies came through the variation of a group of individuals it is difficult to conceive how their arguments can be maintained.

Morgan in his 'Evolution and Adaptation' states the case in a clear and forceful manner: "If amongst the descendants of a single individual a new form or a number of new forms were to arise, then, if they represented only a variety, they would cross with the other forms like the parent species; and, under these conditions, it is generally assumed that the new variety would be swamped . . . If, however, a number of new forms appeared at the same time and left a number of descendants, then the probability that the new group might perpetuate itself is greater, and the chance that such a group would arise is in proportion to the number of individuals that vary in the same direction simultaneously. In this case the new species has not come from a single individual or even from a pair of individuals, but from a number of individuals that have varied more or less in the same direction."

This latter theory of evolution is true to most of the facts as we know them at the present time in the bird world. There is scarcely a species of birds in eastern North America in which there are not individual birds which show some slight variations from the type but these variations are lost in the descendants of these birds. Every field student has observed individual Song Sparrows which have had some markings which distinguish them from other members of the species found in a given locality, yet these individual variations are not perpetuated. The Song Sparrows have certainly been in eastern North America long enough to produce a number of subspecies if these subspecies could evolve out of

modifications in single birds. The facts seem to be that all of these color changes have been swamped in the life of the species which remains constant to that form which in the far past evolved from its antitype.

On the other hand the genus *Passerella* in western North America appears to be in a very unstable situation. One writer has given us nineteen subspecies of this genus. Ridgway confines *P. iliaca unalaschesis* to Alaska and separates it from the form that comes to northern California as *townsendi*. A variety found on Kadiak Island and wintering south to California, he calls *insularis*. The back of this bird he describes as a warm sepia brown, the spots on the breast larger and a deeper brown, and the tail feathers strongly tipped with buff. *P. i. annectens* is similar to *insularis* but smaller, especially the bill, while the color is slightly browner. It is found in Alaska from Cross Sound to Prince William Sound and winters south to California. *P. i. meruloides* is also similar to *insularis* but smaller and the coloration throughout is darker. *P. i. townsendi* is like annectens but the color is darker and the spots on the chest are larger. It breeds on the coast of southern Alaska and winters to northern California. *P. i. fuliginosa* is like *townsendi* but is darker and the spots on the under parts are larger and more confluent.

We recognize that the classification of the subspecies of *Passerella* is still to be finally determined but enough has been done to enable us to recognize definite geographical limits to many of these varieties. It is evident that something is taking place in the western Fox Sparrow which is not occuring in his eastern relative. In the west there is not merely a single individual branching from the parent type but, under the influence of climate, and other undetermined factors, large numbers of individuals of a species are departing from the type. In the east a variation may occur now and then in an individual but it is lost in succeeding generations, while in the west where the variation occurs in a group of birds it survives with the result that a new subspecies evolves.

It is also a recognized fact that many variations of both plants and animals will continue so long as these animals or plants remain under given climatic conditions but if removed to a different climate they will revert to their original type. There are other

plants and animals whose variations have become fixed and they will remain constant though removed to a different climate. This would seem to indicate that in the latter class, when a group of individuals begins to interbreed, "their descendants come to have, after a time, the common blood, so to speak, of all the new forms. If with each union there is a blending of the substances of the individuals, there will result in the end a common substance representing the commingled racial germ-plasm."

When one turns to a study of the songs of birds he finds the same general principle which he discovers in the study of plumage. There are many variations in the songs of our common eastern Song Sparrow. The late John Burroughs said: "I stood one day by a trout stream and suspended my fishing for several minutes to watch a Song Sparrow that was singing on a dry limb before me. He had five distinct songs, which he repeated one after the other. He may have had a sixth or seventh, but he bethought himself of some business in the next field and flew away before he had exhausted his repertory." I was abroad in the fields early one spring when a song came floating over the meadow that was new to my ear. Had some bird strayed from its usual course of migration? This was the first thought that came to my mind. I soon located the song, coming from a clump of alders growing by the side of an old stone wall. It had some suggestion of the notes of a Red-wing. There were many of them about the meadow. This might be a Red-wing improving his song. I approached quietly until the singer was in plain sight,—a common Song Sparrow. His first two notes were more suggestive of our Red-wing than any imitation I had ever heard but at the end of these first notes came a broken, imperfect trill, too low to be heard at a distance. I listened to the bird for a long time and could watch his motions. He was having difficulty in getting out this song. It did not come as easily as his native one and, as I listened, I could not resist the conviction that the bird was trying to imitate the songs of the Red-wings which were coming from different parts of the meadow.

While these observations are interesting they are rare exceptions and the outstanding fact is that these exceptions are not perpetuated in the life of the species nor in subspecies. They are lost with the individuals.

But when we turn from the study of individuals to the group of individuals which has assumed the rank of subspecies then divergences are perpetuated. Unless one listened closely to some of the western chickadees he might think a visitor from Maine had taken a vacation in the west. Whether one is listening to the Mountain Chickadee, the Chestnut-backed or the Long-tailed he can never fail to recognize the chickadee note, pointing to a common ancestry, yet in every one of these species or subspecies of the chickadee there is some slight difference from all the other species or subspecies and this difference, however slight, belongs to all the members of the localized group. It has become a song variation that is passed from generation to generation.

On one journey which covered the states of New England, the southwest, the Pacific Coast, Utah, Idaho, and Montana, I had the privilege of listening to several thrashers. In Arizona I found Bendire's Thrasher, a bird which belongs to the flat country and is more silent than most of its kin. But one morning it mounted the top of a desert bush and poured forth its splendid song. There was no mistaking it for a thrasher song, yet there was something about it that was different from all the others. On the hot sands of southern California I came upon Leconte's Thrasher sitting on the top branch of a small tree and fairly splitting its throat in a song which made me think of the Brown Thrasher singing in the top of an elm tree in Massachusetts yet there was something which was distinctive of this species of birds. Wherever a variation appears in a single individual in its song that variation seems to vanish in its offspring but wherever there is a variation which is common to a group of individuals that variation appears to survive in succeeding generations.

If this is the true biological background of the origin of species and subspecies, even of genera and families, then we pass to an examination of the arguments used in the sexual selection theory. The fact upon which this theory stands or falls is the choice, conscious or unconscious, on the part of the female bird of the most strikingly colored or the best singer among the males. It is our judgment that this choice has never been proven. On the other hand, we believe from observation of bird life that whenever any male bird, be he the least gifted singer of his species, approaches a female at

the hour of her sexual ripeness and succeeds in breaking down her reluctance there is a mating. But for the sake of argument, let us admit that the female does choose the best singer and the most brilliantly colored bird. Her choice must be of an individual bird, say a male Song Sparrow who sings better and is more attractively colored than any other member of his species who has made advances toward this female. This choice, however, is no aid to our sexual selection theory unless these advantages are repeated in the offspring of this union. If they are repeated, then there must be a starting point of a new branch which culminates, at least, in a new subspecies, and there must be as many subspecies started as there are matings with distinctively varied birds. This however does not appear to be the fact. There has been no such breaking up of the species of Song Sparrows in eastern North America. The song type of the species remains constant in the east as does also the plumage.

Indeed, if there actually occurred in any species what can be the only logical conclusion from the premises of the friends of the sexual selection theory, would there be anything left of species? Would not each pair of birds which had mated, provided they possessed any individuality either in song or plumage, be a starting point for a new group of individuals? In a little while the individuals, each differing from all others, would be more common than the species type. This may seem like an attempt to reduce the whole argument to an absurdity, yet we confess that it appears to be the logical conclusion from the fundamental postulates. The weakness of the whole argument is found in the fact that it rests upon a single individual rather than upon a group of individuals.

Turning from the negative to the positive side of this discussion, it remains for us to show how the diversity of bird songs arose out of the maleness of the male. The most powerful factor in the growth of bird-song, so far as external conditions are concerned, is not imitation but isolation. Imitation is the conservative factor in the elaboration of songs rather than the radical factor which it has too often been considered. It has been used too often as a means of showing how birds, imitating the songs of other birds, have copied some of their notes and incorporated them into

their phrasings. Indeed, a great deal of emphasis has been placed on those rare instances where birds have been taken from their nests at an early stage of their development and kept with different species so they have never learned their own song but that of the bird with which they associated. But these are such exceptional cases, always artificial, and often so poorly authenticated, that they have little importance. The chief thing about imitation is that the nestlings learn to sing by imitating the parent birds and are thus from the earliest days bound to the song type of their kind. Thus imitation becomes a tremenduously conservative force in the normal course of nature, tending to keep the offspring true to the type instead of leading them toward diversity in song.

Isolation from the main body of the species is the chief factor in the creation of subspecies. *Melospiza* pushes into the northwestern part of the United States, and, isolated by mountain ranges, under the influence of a moisture-ladened atmosphere, evolves into *rufina*. But, while climate is working its color miracles, isolation is also having its effect upon the song of the birds. If a man goes to a country where the people speak a language unlike his own, say Spanish, he not only acquires a new tongue, but, through long years of isolation, from those who speak his language, he find there is some modification in his native speech. When he returns to his native land, he discovers that he has unconsciously acquired a slight difference in accent and modulation. May not something like this happen through generations of bird-song? As some of the Song Sparrows became separated from their species there arose, through the mere fact of isolation, a slight difference both in tonality and phrasing until these became acquired characteristics and remained permanent. This, I believe is a fact in the building of bird songs which has not been given sufficient weight. Imitation tends constantly to bind the song to the original type of the species but isolation weakens this conservative factor and permits divergence.

It is true that taken alone this fact of isolation is not sufficient to account for the wide variations and the amazing complexity of songs. It is probably a very slight factor in the total process. Mr. Allen writing in 'The Auk' for October, 1919, says: "Is it not reasonable to assume that courtship excitement should lead to a

more and more elaborate form of song-expression as the development of the species goes on, and that the song of the more excited moments should always be somewhat in advance of the ordinary song in point of fervor and elaboration? This view of the development of bird-song might be stated as follows: Let S represent the song first developed out of the call-notes of a certain species. S becomes elaborated as SS under stress of unusual emotion, and SS becoming fixed in the psychology of the species, the bird has two songs, S and SS, the latter a special mating-song uttered at times of only great sexual excitement; then SS tends to become the ordinary song, and a further elaboration, SSS, is evolved to express the unusual emotion for which SS is no longer adequate."

This statement, when taken by itself, seems to be in perfect accord with the facts. It is only when "courtship excitement" is interpreted in terms of the choice of a particular male by the female and that the song SS or SSS is perpetuated as a result of their mating that the theory passes beyond what the facts warrant. "Courtship excitement" is something which grows out of the inner life of the bird, however much it may be stimulated by external conditions. When the sex glands ripen and the harmones are set free the whole nervous system of the bird is stimulated. Then the bird, so to speak, is "beside himself." There is that within him which is driving him to surpass himself. To resort to a homely illustration, no man who loved his sweetheart was ever able to put into words how much he loved her. There is something within him which urges him to a pitch which exceeds his vocabulary. No song was ever adequate to express all that he felt. The inner urge is forcing him to outdo himself. Is not the same thing true in the bird? The entire nervous system, wrought to the highest pitch under the influence of that which has been set free by the sex glands, is ever trying to exceed itself. The bird's song cannot give adequate expression to the inner feeling. That inner drive is ever urging it to do something better. Indulging in a wild dance, the sex stimulation urges it to a wilder dance. Singing at its best, the "craziness" of the bird compels it to sing a better song. This is not only true of the individual; it is true of every individual of a species or a subspecies. Thus the improvement, whether it be in the dance or the song, it not made in one bird but

in a group of birds. The whole species or subspecies is moving upward and the improvement, coming to a group of individuals, may be passed to the offspring, probably through the conservative factor of imitation.

It may be that the song of a species is built out of its call-notes, yet, if our position is true, it is not done in any patchwork fashion. Back of its present call-notes there were more primitive beginnings, the hiss or the grunt, and back of the hiss or the grunt there were those voiceless days when birds, or their ancestors, tried to express their inner life in motion or dance. But the inner sex life had to find expression and the expression was always inadequate to the inner feeling. The creature was always trying to outdo itself and in this attempt is found the primary cause both for variety in song and dance.

If this is the correct view of this difficult question, it is no more amazing that there should be such a variety of bird-songs than that there should be such a variety of colors in birds. This theory seems to simplify the whole process. I am satisfied that we shall never escape the chaos in which we find ourselves at present so long as we continue the attempt to show how bird-songs have grown through mimcry or imitation or through sexual selection. The whole problem is simplified and placed on an understandable basis when we consider song as a growth under the inner urge of the bird, through sexual excitation, to outdo itself and thus see the song of the bird ever pushing out from crude beginnings to something more complex.

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NOTES ON TUBINARES, INCLUDING RECORDS WHICH AFFECT THE A. O. U. CHECK-LIST.

BY ROBERT CUSHMAN MURPHY.

1. **Thalassarche chlororhynchos** (Gmelin). YELLOW-NOSED MOLLYMAWK.

The first North American record of this subantarctic albatross is based upon a skin in the American Museum of Natural History (collection of Dr. L. C. Sanford, No. 9835). The specimen is an adult of unknown sex. It was collected near Seal Island, off Machias Bay, Maine, on August 1, 1913, by Mr. Ernest O. Joye, subsequently coming into the possession of Mr. Allen L. Moses and, finally, that of Dr. Sanford. Seal Island is Canadian territory, and since the locality in which the bird was killed is on the international border, south of Grand Manan, the record constitutes an addition to the local avifauna of both New Brunswick and Maine.

The specimen closely resembles others collected by the writer in the South Atlantic Ocean. The fact that its sex was not determined decreases the value of measurements, which are, however, as follows: Wing 482; tail 186; culmen 116; tarsus 78; middle toe with claw 114 mm.

Thalassarche chlororhynchos is of circumpolar distribution in the southern hemisphere. Its Atlantic breeding grounds are presumably in the "Tristan da Cunha Subarea," as recently defined in Dr. Roberto Dabbene's admirable paper on the petrels and albatrosses of the South Atlantic.[1] Sufficient material is not available for a determination of the subspecific status of the Atlantic bird, or of its relationship with the "*Thalassogeron eximius*" of Verrill.

2. **Calonectris kuhlii kuhlii** (Boie). MEDITERRANEAN SHEARWATER.

While examining series of North American examples of the large shearwater described by Cory as *Puffinus borealis* (Bull. Nuttall Orn. Cl. Vol. 6, p. 84, 1881), the writer has occasionally encountered

[1] El Hornero, Vol. 2, No. 3, pp. 157–179, 1921.

remarkably small specimens, the difference in size, especially noticeable in the bill, being so great as to appear to represent something more than individual variation. Four such birds in the American Museum of Natural History (collection of Dr. Jonathan Dwight) were taken in Long Island waters by Dr. William C. Braislin. That their aberrant aspect among the series of ordinary Cory's Shearwaters has been previously noted is evident from interrogation marks accompanying the entries in Dr. Dwight's catalogue.

The four specimens referred to are fully adult, molting birds. A comparison of the skins with Mediterranean Shearwaters from the southern coasts of France and Spain indicates that the peculiar Long Island birds belong to the same race. The resemblance extends to the diagnostic white marking on the inner web of the outer primaries, a character first pointed out by Hartert and Ogilvie-Grant (Novitates Zoologicae, Vol. 12, p. 97, 1905) who wrote: "in *P. kuhlii kuhlii* a large white mark or some white mottling extends beyond the under wing-coverts, sometimes to beyond the middle of the feathers." The same authors showed that this character is not shared by the larger race of *P. kuhlii* inhabiting the Azores, Canaries, Madeira, etc. It is likewise lacking in North American specimens of Cory's Shearwater.

The records and measurements of the four Long Island birds, together with similar data for typical examples of Cory's shearwater are as follows:

Calonectris kuhlii kuhlii (Boie)

	Wing	*Tail*	*Culmen*	*Tarsus*	*Middle toe with claw*
45827 ♂ Dwight Coll., Montauk Point. N. Y., Aug. 15, 1907.	342	129	47	54	68
45828 ♂ Dwight Coll., Montauk Point, N, Y., Aug. 15, 1907.	329	129	48	51	62
45825 ♂ Dwight Coll., Off Amityville, N. Y., Oct. 4, 1902.	314	122	45	49	61
45826 ♀ Dwight Coll., Off Amityville, N. Y., Oct. 4, 1902.	322	117	46	49	65

Calonectris kuhlii borealis (Cory)

	Wing	*Tail*	*Culmen*	*Tarsus*	*Middle toe with claw*
8975 ♂ Sanford Coll., New York Bay, Sept. 9, 1918.	358	136	57	56	74
24449 ♂ Dwight Coll., Narragansett Bay, R. I., Sept. 29, 1886.	355	133	56	55	72
64709 ♂ Amer. Mus. Coll., Off Amagansett, N. Y., Oct. 20, 1887.	347	133	56	57	70
24450 ♀ Dwight Coll., Narragansett Bay, R. I., Sept. 29, 1886.	349	133	54	56	70

Cory's description and published measurements of the type specimen of "*Puffinus borealis*" make it clear that it was the larger race which he collected and named.

The type locality of the "*Procellaria kuhlii*" of Boie, the form now added to the known avifauna of North America, is the coastal waters of Corsica. Its breeding range, so far as determined, is confined to the Mediterranean, the Adriatic, the Aegean, and the Sea of Marmora, but during its wanderings it passes Gibralter and enters the pelagic range of *Calonectris kuhlii borealis*, sometimes as is evident, reaching the coast of North America. The Mediterranean Shearwater should therefore be included in the next edition of the A. O. U. 'Check-list.' American collections of Cory's Shearwaters ought, moreover, to be examined for additional specimens of the Mediterranean race.

3. **Oceanodroma hornbyi** (GRAY). HORNBY'S PETREL.

Oberholser (Auk, Vol. 34, pp. 465, 466, 1917) has shown that this petrel must remain in the genus *Oceanodroma*. He also states his reasons for the opinion that the species should be reinstated in the regular list of North American birds.

For many years after G. R. Gray had described Hornby's Petrel, in 1853, the original skin in the British Museum remained unique. The type bore no label, but was believed to have come from the northwest coast of America.

In 1887 (*fide* Godman, 'Monogr. Petrels,' p. 36, 1907) E. W. Nelson reported that he had seen numbers of Hornby's Petrels "both in May and October, while crossing a part of the Pacific,

some 500 miles broad, bordering the Aleutian chain." Doubts were subsequently cast upon the identification, however, by Henshaw.

In 1895 the National Museum of Chile, at Santiago, obtained two immature specimens, including a nearly full-grown bird with only a few traces of grayish-white down still clinging to its belly. These came from an inland region, east of Taltal. They were not recognized as *Oceanodroma hornbyi*, and were described anew by R. A. Philippi as "*Procellaria* (*Oceanites*) *collaris*" (Verhandlungen des deutschen wissenschaftlichen Vereins zu Santiago de Chile, Vol. 3, Pt. 1, pp. 11–13, plate). Philippi's account states:

"Das Exemplar von Sturmschwalbe, dessen Beschreibung ich hiermit gebe, is dadurch besonders merkwürdig, dass es inmitten des Landes, östlich von Taltal, in Gesellschaft eines ganz jungen Vögelchens, welches noch mit dem vollen Flaum bekleidet ist, todt gefunden wurde. Unser Museum verdankt es H. Dr. Darapsky.

"Der vogel hat ganz die Grösse und Gestalt der übrigen Sturmschwalben, von denen er sehr leicht durch folgende Diagnose unterschieden werden kann."

The Latin diagnosis which follows, the recorded measurements, and the full page, monochrome plate, made from a crayon drawing, leave no room for doubt that the specimen described was *Oceanodroma hornbyi* notwithstanding minor discrepancies in the amount of white pictured on the face and throat. The figure was drawn from a poorly mounted bird, which doubtless accounts for slight distortions of the color areas. Both of the specimens have been seen by Dr. Frank M. Chapman during visits to Santiago.

The description of *Procellaria collaris*, and a subsequent, slightly more detailed account by Philippi (*vide infra*), were apparently overlooked by Godman, for the specific name *collaris* appears neither in the index nor the synomymy of the 'Monograph of the Petrels'.[1]

During the Brewster–Sanford South American expedition of the American Museum of Natural History, Mr. Rollo H. Beck collected 56 specimens of *Oceanodroma hornbyi* in the offshore waters of the

[1] The Chilean specimens are referred to again by Quijada in the Catalogo ilustrado i descriptivo de las Aves Chilenas, Bol. Mus. Nac. Chile, Vol. 1, No. 8 (pp. 82, 83 of the repaged extract), 1911.

Peruvian coast, and proved that the species is a common bird in this region. Mr. Beck's specimens were all taken during June 1913, between the approximate latitudes of Ancon (11° 47′ S.) and Cerro Azul (13° 4′ S.), in waters from 15 to about 200 miles from the shore. He first noted the species in the vicinity of Hormigas de Afuera Islets, 38 sea miles west of Callao, on June 4. On June 6, when about 200 miles off shore, he obtained the first specimens, along with numerous examples of *Oceanodroma markhami* and other petrels. Thereafter he saw *O. hornbyi* frequently, chiefly beyond 25 miles from shore, often feeding and coming to his bait in groups of a score or so. His notes of June 25, on which date he collected 30 miles off Cerro Azul, contain the observation that in early morning, while the sun was still low, the white breasts of Hornby's Petrels shone like silver as the birds darted back and forth among other species. After June 27 he changed his field of operations to the islands and inshore waters of the Pisco Bay region, and thenceforth saw the species no more.

All of Beck's specimens, the majority of which still remain in the Brewster-Sanford Collection, are birds which had resting sex organs. Most of the individuals were completing, or had recently completed, the molt and renewal of the flight feathers.

In the same month of a later year, June 1916, Dr. Frank M. Chapman also observed Hornby's Petrel along the Peruvian coast. He has kindly supplied me with the following extract from his notes of June 23, 1916:

"Leave Pisco at 7:15, make the Boqueron in the face of a stiff breeze. At 8 A. M., we were about ten miles off shore, and the ocean swarmed with Petrels; a large, black *Puffinus*, and a smaller one, in countless numbers were active, except one flock of several hundred resting on the water. Many Gannets were diving from a height of from fifty to sixty feet. A few Yellow-nosed Albatrosses were seen . . . splendid, sweeping creatures. There were several white-rumped Petrels and dozens of *O. hornbyi*; the latter the most erratic flier I have ever seen . . like a bat, swift, and nighthawk in one. They were skimming here, flitting there, then suddenly swung off with the wind a hundred yards or more so quickly one nearly lost sight of them."

To these field notes Dr. Chapman has added the following

comment, relating to the apparent absence of the species during the period of the year which doubtless includes its breeding season:

"December 4–7, 1918, while *en route* from Callao to Mollendo, I sailed over this same area, but although on the lookout for them I did not see a single Hornby's Petrel."

In Captain R. Paefsler's several records of the capture or identification of sea birds (Journel für Ornithologie, Jahrg. 61, pp. 41–51, 1913; *idem*, Jahrg. 62, pp. 272–278, 1914; and Ornithologische Monatsberichte, Jahrg. 23, pp. 59–61, 71, 72, 1915), there are numerous references to *Oceanodroma hornbyi*, which he observed along the west coast of South America at various points between the latitudes of Chimbote, Peru, and a little north of Valparaiso, Chile. Paefsler evidently recognized the identity of the petrel with Philippi's species, for he employs the name *collaris* as well as *hornbyi*, and he states (J. f. O., 1913, p. 49) that on the night of Feb. 16, 1912, off Nasca, Peru, an example of "*Oceanites collaris* oder *Oceanites hornbyi* an Bord geflogen." Paefsler's records are as follows, most of them being based apparently upon sight identifications:

July 14, 1910.	32° S.	72° W.	(Off Quilimari, N. of Valparaiso).
June 17, 1911.	16° 30′ S.	73° 18′ W.	(Off Islay). One flew on board.
June 18, 1911.	14° S.	76° 18′ W.	(Off Pisco).
July 30, 1911.	17° S.	72° 30′ W.	(Off Ilo).
Feb. 16, 1912.	15° 12′ S.	75° 36′ W.	(Off Nasca). One flew on board.
Feb. 18, 1912.	9° S.	86° W.	(Off Santa Head, N. of Chimbote).
May 30, 1913.	20° 42′ S.	70° 18′ W.	(Off Iquique).
June 6, 1913.	15° S.	75° 48′ W.	(Off Nasca).
June 15, 1913.	23° S.	70° 42′ W.	(Off Mejillones).
Oct. 14, 1913.	29° 30′ S.°	71° 30′ W.	(Off Coquimbo).
Oct. 17, 1913.	20° 36′ S.°	70° 24′ W.	(Off Iquique).
Nov. 13, 1913.	30° S.	71° 36′ W.	(Off Coquimbo).

With regard to the breeding locality of *O. hornbyi*, we have only the information published by Philippi. This author's second pap relating to the species (Anales del Museo Nacional de Chile, V 15, Sect. 1, pp. 90–92, pl. 42, 1902) is in part a reprint in Spani of the German description cited above, with the addition of

colored plate. He states somewhat more fully that the mounted specimen in the Santiago Museum was obtained on the tableland east of Taltal, at a considerable altitude, in company with a dead chick of the same species, and that he therefore believes this region to be the petrel's breeding ground. The supposition surely seems to be supported by circumstantial evidence, and it would be altogether plausible were it not that mainland breeding sites are almost unknown among the Tubinares. If the petrels do actually nest in the Chilean mountains, their individual burrows are probably scattered over wide areas, for thickly populated colonies would soon be discovered and decimated by predaceous mammals.

It is rather curious that the aged Dr. Philippi never recognized his bird as *Oceanodroma hornbyi*, for he was at no time confident of the validity of "*Procellaria collaris.*" He wrote, for instance:

"Coues has described in the 'Proceedings of the Academy of Philadelphia' for the year 1864, which I have not been able to consult, two species under the names *O. gracilis* and *O. lineata*. Perhaps our species is one of these, or one of the other described forms of the genera *Thalassidroma* or *Procellaria*. Ornithologists who have at their disposal the pertinent literature may decide" (Translated from the Spanish, *loc. cit.* p. 91.)

From all of the above it is evident that *Oceanodroma hornbyi*, like *O. markhami*, *Thalassidroma tethys*, *Diomedea irrorata*, and several species of *Pterodroma*, is a bird of the warmer, offshore areas of the tropical and subtropical eastern South Pacific. In common with all the forms named, it is truly pelagic during the non-breeding season, ranging hundreds of miles from land, and avoiding the inshore zone of the Humboldt Current where, as the writer learned during investigations in 1919–1920, an entirely distinct assemblage of sea birds, comprising penguins, diving petrels, shearwaters and fulmars of antarctic affinities, and endemic, strictly littoral steganopodes, abound in the cool, upwelling waters close to the coast. If *O. hornbyi* breeds in the southern parts of the Maritime Andes, it must, of course, cross the relatively narrow belt of cool water when passing between its nesting site and its pelagic feeding grounds; but it is rarely or never to be found by day in the inshore region. Loomis's suggestion that "Hornby's Petrel may prove to be a common Southern Hemisphere species

that visits the Northern Hemisphere after its breeding season" (Proc. Calif. Acad. Sci. (4), Vol. 2, Pt. 2, p. 179, 1918) seems unlikely, since it is in general the "cold water" types of southern Tubinares, such as *Puffinus griseus, Priocella, Oceanites oceanicus,* etc., rather than the southern subtropical representatives, which make regular migrations to littoral waters of the northern hemisphere.

Gray's description (Proc. Zool. Soc. Lond., Vol. 21, p. 62, 1853) states that the type specimen of *O. hornbyi* came "from the northwest coast of America," and that Admiral Hornby had "obtained it during his command on the Pacific station," perhaps during the period in which his headquarters were at Vancouver. In view, however, of the known circumstances and the probabilities as to the bird's habitat, together with the fact that the northern range has never been confirmed, and the utter lack of certainty as to the exact source of an unlabeled skin brought to England by a naval officer who had doubtless traversed the entire west coast of South America, it would seem to the writer that the species should be stricken entirely from the list of North American birds unless collateral evidence that the type was taken in the North Pacific can be produced.

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SUPPLEMENTARY NOTES ON THE BIRDS OF BERKSHIRE COUNTY, MASSACHUSETTS.

BY WALTER FAXON AND RALPH HOFFMAN.

The following notes are offered as a supplement to the authors' 'Birds of Berkshire County, Massachusetts,' published in the 'Collections of the Berkshire Historical and Scientific Society,' Vol. III, pp. 107–166, Pittsfield, Mass., 1900. The numbers enclosed in brackets refer to the pagination of the separates issued at the same time.

P. 115 [9]. **Hylocichla mustelina** (Gmel.). WOOD THRUSH.—Seen as late as September 16 (Stockbridge).

P. 116 [10]. **Hylocichla ustulata swainsoni** (Tschudi). OLIVE-BACKED THRUSH.—Add Washington to the list of towns in which this bird breeds.

P. 117 [11]. **Hylocichla aliciae bicknelli** Ridgw. BICKNELL'S THRUSH.—Since the publication of the Birds of Berkshire the presence of Bicknell's Thrush on the summit of Greylock Mountain has been recorded anew by R. H. Howe, Jr., June 18, 1902, one heard (Auk, XIX, Oct, 1902, p. 405), C. J. Maynard, May 28–30, 1910, about twelve pairs (Record of Walks and Talks with Nature, III, 1910, p. 120), and C. F. Jenney, June 8, 9, 1911, two heard, one seen (Record of Walks and Talks, IV, 1911, p. 173). Some of those seen by Mr. Maynard were undoubtedly transients, since only one or two pairs of Bicknell's Thrushes have ever been found on Greylock in the breeding season.

P. 117 [11]. **Hylocichla fuscescens fuscescens** (Steph.). VEERY.—A Veery shot by the senior author in Lanesborough, Sept. 27, 1900, was recorded in 'The Auk,' XVIII, 1901, p. 198, as *H. f. fuliginosa* Howe (*H. f. salicicola* Ridgw., see Noble, Bull. Mus. Comp. Zool., LXII, 1919, p. 565), but we now believe it is *H. f. fuscescens* in autumn plumage. It is in the Collection of the Museum of Comparative Zoology.

P. 118 [12]. **Penthestes hudsonicus littoralis** (Bryant). ACADIAN CHICKADEE.—In the 'Birds of Berkshire,' p. 118, and previously in 'The Auk,' VII, 1890, p. 408, birds found on Greylock Mountain in December, 1889, were referred to as *Parus hudsonicus* Forster. It has since been found that the individuals belonging to this species that migrate south into Massachusetts in the autumn belong to two geographical races, *Penthestes hudsonicus littoralis* (Bryant) and *P. h. nigricans* C. W. Townsend. It therefore behooves us to revert to these specimens in the light of the knowledge since acquired.

On the 14th of December, 1889, after a few days' stay in Ashby, Mass., the late Mr. William Brewster and the senior author of these 'Notes' went to Laban Wilbur's, the highest of the farms that then lay in the secluded Greylock Notch, North Adams. On the 15th we found one Hudsonian Chickadee in the second-growth spruces above Wilburs' house (altitude, 1600 feet), and on the following day Mr Brewster shot two out of three seen in the same neighborhood. The two that were shot have been determined by Dr. Townsend (Auk, XXXIV, 1917, p. 163) as *P. h. littoralis* (Coll. W. Brewster, No. 30309) and *P. h. nigricans* (Coll. W. Brewster No. 30310). Mr. Brewster was suddenly called home on the evening of the same day, but I remained at Wilbur's until the 20th of December. On the 17th I saw one Hudsonian on the Greylock carriage-road from North Adams, two on the 18th on the "Winter Road" from the Notch to North Adams, and on the 19th a flock of from six to ten among the second-growth spruces in the "Mountain Pasture" on the Greylock carriage-road (alt. 2200 feet); from this flock I shot one, determined by Dr. Townsend (*l. c.*) as *P. h. nigricans* (Coll. W. Brewster, No. 26270).

Thus within a space of four days Mr. Brewster and I found from twelve to sixteen of these birds on the sides of the Greylock Mountain range, which seems to indicate a heavy influx into that region. Nor was the flight confined to *western* Massachusetts: on the 19th of October of the

same year I shot one of a pair found in Arlington, Middlesex Co., (Auk, VII, 1890, p. 408) which proved to be *P. h. littoralis* (Coll. W. Brewster, No. 25621), and another passed the winter of 1889–90 in a pine grove in Waverley in the same County (Auk, *l. c.*). The Waverley bird was not killed and therefore its race was not ascertained.

The two specimens shot by Mr. Brewster in the Greylock Notch on the 16th of October, 1889, afford the only instance, I believe, of the two subspecies being found together.—W. F.

P. 118 [12]. **Penthestes hudsonicus nigricans** C. W. Towns. LABRADOR CHICKADEE. *Vide supra.*

P. 119 [13]. **Telmatodytes palustris palustris** (Wils.). LONG-BILLED MARSH WREN.—This bird was again discovered by us at the upper end of Pontoosuc Lake, Lanesborough, on the 22d of May, 1901, and a pair was found in Hoosac Swamp, Williamstown, in June, 1902, by R. H. Howe, Jr. (Auk, XIX, Oct. 1902, p. 405).

P. 119 [13]. **Cistothorus stellaris** (Naum.). SHORT-BILLED MARSH WREN.—Add Pittsfield to the number of towns in which we have found this Wren.

P. 120 [14]. **Troglodytes aedon aedon** Vieill. HOUSE WREN.—Seen up to Sept. 28.

P. 120 [14]. **Mimus polyglottos polyglottos** (Linn.). MOCKING-BIRD.—One spent the winter of 1917–18 in Williamstown, frequenting a porch to feed on the berries of the Virginia Creeper.

P. 121 [15]. **Vermivora peregrina** (Wils.). TENNESSEE WARBLER.—Two, in full song, were discovered by the junior author at Berry Pond, Hancock, July 21, 1919 (alt. 2000 feet). These taken in connection with the specimen found by the senior author on Mt. Greylock, July 15 and 16, 1888, (Auk, VI, 1889, p. 102) make it highly probable that this species breeds in small numbers in Berkshire.[1]

P. 121 [15]. **Compsothlypis americana usneae** (Brewst.). NORTHERN PARULA WARBLER.—In the summer of 1919 Parula Warblers were seen in the village streets of Stockbridge, apparently breeding in the avenues of Norway Spruces whose pendent branchlets perhaps supplied the place of Usnea lichens.

P. 121 [15]. **Dendroica aestiva aestiva** (Gmel.). YELLOW WARBLER.—One was seen in Stockbridge on the 1st of October.

P. 121 [15]. **Dendroica pensylvanica** (Linn.). CHESTNUT-SIDED WARBLER.—Seen as late as Sept. 23.

[1] A Golden-winged Warbler, *Vermivora chrysoptera* (Linn.), has been recorded by Mr. C. J. Maynard (Record of Walks and Talks with Nature, III, 1910, p. 123) as observed on a trip to Mt. Greylock, May 28–30, 1910. No definite locality is specified, the bird being listed with others seen "about the villages." Mr. Maynard was accompanied on this trip by five or six pupils, but he does not remember who was responsible for the identification of the Golden-wing. Under these circumstances the record cannot be taken as a valid one for Berkshire County.

P. 122 [16]. **Dendroica magnolia** (Wils.). MAGNOLIA WARBLER.—Within the last decade there appears to have been a distinct encroachment southward and into the river valleys on the part of certain Canadian birds in Berkshire. This species, for example, was found to be generally distributed in South Sandisfield in the summer of 1912, and during the summer of 1919 it was not infrequently met with in Stockbridge, where it was either very rare or altogether unknown twenty years ago.

P. 123 [17]. **Dendroica castanea** (Wils.). BAY-BREASTED WARBLER.—Extend the period of the vernal migration to May 30.

P. 124 [18]. **Dendroica vigorsi** (Aud.). PINE WARBLER.—Add to the records, Lanesborough, Sept. 25, 1900, one male.

P. 124 [18]. **Seiurus motacilla** (Vieill.). LOUISIANA WATER-THRUSH.—When our 'Birds of Berkshire' was published in 1900, there was but one record of the Louisiana Water-Thrush in the County, viz. Sheffield, June 11, 1896, a pair feeding fledged young (Faxon, Auk, XIII, 1896, p. 344). Since that time we have detected it at Richmond Pond, on the boundary line between Pittsfield and Richmond, one male, June 8, 1901 (Auk, XXVI, 1909, p. 311); one singing in Hulbert's Swamp, Lanesborough, June 9, 1901; a pair, July 2, 1909, on Fife Brook, a tributary of the Deerfield River in the town of Florida, at an altitude of 1900 feet, and one at Berry Pond, Hancock (altitude 2000 ft.) on July 5, 1920. Mr. William Brewster also discovered a pair with a nest containing six young at Glendale in Stockbridge, June 28, 1902 (Auk, XXVI, 1909, pp. 310–311).

P. 126 [20]. **Oporornis agilis** (Wils.). CONNECTICUT WARBLER.—Add to the records, Lanesborough, Sept. 30, 1900.

P. 126 [20]. **Wilsonia pusilla** (Wils.). WILSON'S WARBLER.—Extend the autumnal migration dates to Sept. 30.

P. 127 [21]. **Vireosylva gilva gilva** (Vieill.). WARBLING VIREO.—Seen as late as Sept. 24 in Lanesborough, 1900.

P. 128 [22]. **Lanius ludovicianus migrans** Palmer. MIGRANT SHRIKE.—Mr. Gerald H. Thayer reports seeing one in Lanesborough, Aug. 18, 1900 (Auk, XIX, 1902, p. 296), in a hillside pasture above Berkshire Village. This is the first record since Mr. S. G. Tenney's discovery of three nests in Williamstown in 1883 and 1886. The junior author of these 'Notes' saw one in Stockbridge in the month of August.

P. 130 [24]. **Stelgidopteryx serripennis** (Aud.). ROUGH-WINGED SWALLOW.—Since the publication of the 'Birds of Berkshire' the Rough-winged Swallow has been reported by Mr. William Brewster from Glendale in the township of Stockbridge, where he found a pair with three full-grown young, July 3, 1906 (Auk, XXIV, 1907, pp. 221–222). The junior author also observed it in the adjoining town of West Stockbridge in the summer of 1919. During a trip to Berkshire, May 28–30, 1910, Mr. C. J. Maynard found a pair nesting in an old Kingfisher's hole near the top of a bank about twenty feet high on the road at the lower end of Pontoosuc Lake, Pittsfield, and Judge Charles F. Jenney saw two near the same place on the 7th of

June, 1911 (Maynard's Record of Walks and Talks with Nature, III, 1910, p. 122, IV, 1911, p. 171).

P. 130 [24]. **Hesperiphona vespertina vespertina** (Cooper). EVENING GROSBEAK.—We have been advised of the occurrence of this bird in Lee and Williamstown (Caroline R. Leake, Bird-Lore, XI, 1909, p. 85) during the winter of 1908–09; in South Sandisfield in December, 1913 (F. Walters, *in litt.*); and in Stockbridge in early April, 1916.

P. 131 [25]. **Loxia leucoptera** Gmel. WHITE-WINGED CROSSBILL.—This bird is occasionally seen in summer as well as in winter. Mr. Gerald H. Thayer reports that a flock of five or six individuals stayed in Lanesborough as late as the 4th of June, in the year 1900 (Auk, XIX, 1902, p. 297), and we found one in full song in the coniferous forest of Mt. Greylock in August, 1911.

P. 133 [27]. **Passerherbulus henslowi henslowi** (Aud.). HENSLOW'S SPARROW.—Add to the list of towns in what we have found this bird breeding, Peru, Cheshire, and Savoy. Mr. R. H. Howe, Jr., has reported it from Williamstown also (Auk, XIX, 1902, p. 404).

P. 133 [27]. **Zonotrichia albicollis** (Gmel.). WHITE-THROATED SPARROW.—What was said above concerning the extension of the breeding area of *Dendroica magnolia* southward and into the valleys of Berkshire during the last ten years is equally true of the White-throated Sparrow. It was found generally distributed in South Sandisfield in the summer of 1912, and in the Housatonic Valley towns in the summer of 1917 and 1919. It has been known to summer even to the south of Berkshire, in Litchfield and Winsted, Litchfield Co., Conn. (Woodruff, Auk, XXIII, 1906, p. 461; Sage and Bishop, Birds of Connecticut, 1913, p. 129)[1]

P. 136 [30]. **Dolichonyx oryzivorus** (Linn.). BOBOLINK.—Seen as late as Sept. 17 in Stockbridge.

Sturnus vulgaris Linn. STARLING.—The European Starling is now generally distributed, as a permanent resident, through the Housatonic Valley towns. It was introduced into New York City in 1890, and about one hundred were liberated in Springfield, Mass., in 1897 (Morris, Birds of Springfield and Vicinity, 1901, p. 42). The Berkshire birds appear to have invaded the County from the South by way of the Housatonic River valley.

P. 138 [32]. **Otocoris alpestris alpestris** (Linn.). HORNED LARK.—A flock is reported to have spent several weeks in Stockbridge village during the winter of 1915–16.

P. 138 [32]. **Otocoris alpestris praticola** Hensh. PRAIRIE HORNED LARK.—Add Stockbridge to the towns in which this bird breeds.

P. 140 [34]. **Empidonax flaviventris** (W. M. & S. F. Baird). YELLOW-BELLIED FLYCATCHER.—Spring migration, May 22-June 2 (Lanesborough, 1901).

[1] *Guiraca caerulea* (Linn.). BLUE GROSBEAK. Professor S. F. Clarke tells us that he had four of these birds in his grounds in Williamstown in the month of October. This is the only record for the County of Berkshire.

P. 140 [34]. **Nuttallornis borealis** (Swains.). OLIVE-SIDED FLYCATCHER.—Seen as late as Sept. 7 at Bash Bish Falls, Mount Washington.

P. 141 [35]. **Myiarchus crinitus** (Linn.). CRESTED FLYCATCHER.—Seen up to Sept. 17 in Stockbridge.

P. 142 [36]. **Sphyrapicus varius varius** (Linn.). YELLOW-BELLIED SAPSUCKER.—Add, Ward Pond, Becket, one female, July 12, 1909.

P. 143 [37]. **Coccyzus americanus americanus** (Linn.). YELLOW-BILLED CUCKOO.—Arrived in Lanesborough, May 12, 1911; seen up to Sept. 29.

P. 144 [38]. **Cathartes aura septentrionalis** Wied. TURKEY VULTURE.—At least one more Turkey Vulture has been killed in Berkshire County since 1900. In the 'Boston Globe' newspaper of July 15, 1905, there is a notice of one that was shot in Becket "recently" by William A. Schlesinger and presented to the Museum of Natural History in Springfield, Mass., and in 'The Auk' for October, 1905, p. 413, Mr. Robert O. Morris records a young specimen killed by Walter Stanley in Becket on the 8th of June, 1905, and sent to the Museum of Natural History in Springfield.

Possibly both of these records refer to the same bird, although the name of the collector is different in the two cases.

P. 145 [39]. **Astur atricapillus atricapillus** (Wils.). GOSHAWK.—Mr. Gerald H. Thayer (Auk, XIX, 1902, p. 296) reports seeing a large young Goshawk fly past him on the eastern side of Hoosac Mountain, within the limit of Berkshire County, on the 15th of August, 1900. It is doubtful whether, under the circumstances, Mr. Thayer could clearly discriminate between a Goshawk and a large female Cooper's Hawk (*Accipiter cooperi* Bonap.); we therefore reject this as a valid summer record for the former species.

P. 146 [49]. **Buteo platypterus** (Vieill.) BROAD-WINGED HAWK.—The junior author saw one at Ward's Pond, Becket, on the 12th of July, 1909, and discovered a nest containing young in Stockbridge. We also observed it in Lanesborough on the 30th of April, 1911.

P. 147 [41]. **Falco peregrinus anatum** Bonap. DUCK HAWK.—Has been found nesting in Cheshire by Mr. Gerald H. Thayer, and near Bash Bish Falls, Mount Washington by the junior author.

Phasianus torquatus Gmel. RING-NECKED PHEASANT.—This introduced species is now well established in Berkshire County.

P. 149 [43]. **Oxyechus vociferus** (Linn.). KILLDEER.—Add to the records, West Stockbridge, June 22, 1919, a pair with (apparently) one young.

P. 151 [45]. **Bartramia longicauda** (Bechst.). UPLAND PLOVER.—The senior author found this bird in Lanesborough, May 30, 1901. R. H. Howe, Jr. (Auk, XIX, 1902, p. 404) saw seven pairs in Williamstown, June 17–22, 1912, and F. G. and M. C. Blake told him that they saw four on June 19, 1900, and two on June 15, 1901, in Williamstown. The junior author saw one in Lenox, Aug. 9, 1919. The above dates prove conclusively that

the Upland Plover breeds in Berkshire, for it has eggs by May 25 and its young are hatched by June 4, on Martha's Vineyard, according to O. Durfee (Auk, XX, 1903, p. 65).

P. 152 [46]. **Porzana carolina** (Linn.). SORA.—Add, Pittsfield, June, 1901.

Herodias egretta (Gmel.). EGRET.—Three were seen by the junior author, August 8, 1919, in the pond (so-called) formed by the Housatonic River at the Lenox railway station. A farmer's boy declared that they had been there two or three weeks. Sole record for the County.

Ixobrychus exilis (Gmel.). LEAST BITTERN.—The Least Bittern is to be added to the list of summer birds of Berkshire. Mr. Schurr has found it in Pittsfield and the junior author of this paper discovered one at the head of the Stockbridge Bowl in August, 1914.

P. 157 [51]. **Larus argentatus** (Pont.). HERRING GULL.—According to a communication to a local newspaper, a flock of Herring Gulls, rare birds in Berkshire, spent several days along the Housatonic River and its flooded meadows in Stockbridge during the winter of 1915–16.

P. 157 [51]. **Podilymbus podiceps** (Linn.). PIED-BILLED GREBE.—This bird breeds also in Stockbridge, and at Lenox Station.

P. 158 [52]. **Colymbus holboellii** (Reinh.). HOLBOELL'S GREBE.—A specimen in the Science building, Springfield, Mass., was taken alive in Otis "a few winters ago," according to R. O. Morris (Birds of Springfield and Vicinity, 1901, p. 6). Another was captured alive at Yocum Pond, Becket, Feb. 18, 1904 (R. O. Morris, in litt.). A third was found on March 4th, 1912, in South Sandisfield, by Frank Walters, and given by him to the Museum of the Berkshire Historical and Scientific Society of Pittsfield. The gift was accompanied by the following interesting letter from Mr. Walters which was printed in the Berkshire Eagle, a Pittsfield newspaper, shortly afterwards:—

Mr. H. H. Ballard,
Pittsfield, Mass.

DEAR SIR:—I am sending you to-day by express a specimen of Holboell's Grebe. About five o'clock on the afternoon of Monday, March 4, I was crossing a bridge over a little brook tributary to Sandy Brook, and a little over a mile north of the Massachusetts-Connecticut state line on the road leading from South Sandisfield, Mass., to Norfolk, Conn., and happening to glance down, I saw about twenty-five feet away a bird sitting on the ice. It allowed me to approach within three or six feet of it and then plunged suddenly into the water. This open stretch of water was on an average only about two feet in width and possibly twenty feet long. It swam to the upper end of this and turning came back to where it had taken to the water. As it came to the surface for air, I dropped my cap over its head and lifted it from the water.

I wish to state, in passing, that this bird used its wings continually while swimming, using them much in the same manner as if in the air. Mr.

Chapman and others have stated that grebes use the feet only in swimming. While the bird was in the water I ran along the edge of the ice and had an excellent opportunity to observe this use of the wings, as the bird was almost at my feet. I found also that they have the heron-like habit of striking directly at a person's eye when captured. Finding that he could not reach my face, he then tried to strike the buttons off my coat.

On reaching home, I identified this bird as Holboell's Grebe and you will find that its measurements indicate it to be fair average size. While the bird is in winter plumage, you will note the many reddish spots on its neck.

After exhibiting it to some people in the vicinity, I returned it to the spot where I found it, twenty-four hours after its capture. That night, however, the thermometer dropped to several degrees below zero, and on March 6 at 2.30 P. M., I went to the brook to see if the bird was still there and found it frozen into the ice and of course dead. I had to get a stick and smash the ice to get the bird out. I think you will agree with me that it is a nice specimen, not having been shot or otherwise injured.

I would be glad to see it added to the collection of birds in the museum of which I understand you are curator.

Mr. Walter's is the seventh specimen of Holboell's Grebe recorded for Berkshire County. All of them were captured either in the winter or early spring.

Carpenteria, Calif.

NOTES ON NORTH AMERICAN BIRDS.

XI.

BY HARRY C. OBERHOLSER

The following notes on seven North American birds[1] have been made during the course of other investigations, and are here published as of possible interest to other ornithologists. They concern species of the families Charadriidae, Bubonidae, Laniidae, and Vireonidae.

[1] For previous papers in this series, *cf.* 'The Auk,' XXXIV, April, 1917, pp. 191–196; XXXIV, July, 1917, pp. 321–329; XXXIV, October, 1917, pp. 465–470; XXXV, January, 1918, pp. 62–65; XXXV, April, 1918, pp. 185–187; XXXV, October, 1918, pp. 463–467; XXXVI, January, 1919, pp. 81–85; XXXVI, July, 1919, pp. 406–408; XXXVI, October, 1919, pp. 556–559; XXXVIII, January, 1920, pp.

Charadrius nivosus (CASSIN).

The bird described by Cassin as *Aegialitis nivosa*[1] has by most recent authors been considered a distinct species. It is very similar in general appearance to *Charadrius alexandrinus alexandrinus* (Linnaeus), but differs chiefly in having the lores wholly white (instead of with a black line from the eye to the bill), and the rufous of the pileum less pronounced in fully adult plumage. Examination of a large series of birds of this species shows, however, that the characters distinguishing these two forms are not constant. That of the rufous of the head is too changeable to be of much value in the determination of specimens, so that the color of the lores is much the best character. But even this varies to such an extent that it is impossible to find any definite line of demarcation between the two forms. Specimens of the American *Charadrius nivosus* occur with partly black lores, and of the Old World *Charadrius alexandrinus* with nearly white lores. In view of these facts, it is of course, inadvisable to maintain the specific distinction of *Charadrius nivosus*. It, therefore, should be regarded as a subspecies of *Charadrius alexandrinus*. It is interesting to note that this is the view taken many years ago by Mr. Henry Seebohm,[2] as well as by some recent authors. Mr. Ridgway has recently separated[3] the American birds into two races; so that our Snowy Plovers should now stand as *Charadrius alexandrinus nivosus* (Cassin), and *Charadrius alexandrinus tenuirostris* (Lawrence).

Cryptoglaux funerea magna (BUTURLIN).

A few years ago a specimen of *Cryptoglaux funerea funerea* (Linnaeus) was reported from the Pribilof Islands, Alaska, as the first record of this bird for North America.[4] A recent examination of this specimen shows conclusively that it belongs, not to the typical form native of Europe, but to the more recently described race, *Cryptoglaux funerea magna* Buturlin.[5]

[1] Rep. Explor. and Surv. R. R. Pac., IX, 1858, p. 696 (Presidio, near San Francisco, California).

[2] Geographical Distribution of the Charadriidae, 1887, p. 171.

[3] Bull. U. S. Nat. Mus., No. 50, part VIII, 1919, pp. 136–140.

[4] Evermann, The Auk, XXX, No. 1, January, 1913, p. 18.

[5] *Nyctea lamagna* Buturlin, Psovaia i Ruzheinaja Okhota, 1907, No. 6, March, 1907; Ornith. Monatsber., XV, No. 5, May, 1907, p. 80 (Kolyma River at N. Lat. 68° 40′, northeastern Siberia).

This is a very pale race and the largest of all the subspecies of *Cryptoglaux funerea*. Geographically it is near Alaska, for it inhabits the extreme northeastern part of Siberia. The North American specimen above mentioned is perfectly typical and measures as follows: wing, 185.5; tail, 115; bill without cere, 15.5; tarsus, 30 mm. It is an adult female, No. 239184 of the United States National Museum collection, and was taken on St. Paul Island, Pribilof Islands, Alaska, January 26, 1911, by Mr. Walter L. Hahn. By reason of this change, *Cryptoglaux funerea funerea* (Linnaeus) must be replaced as a North American bird by *Cryptoglaux funerea magna* (Buturlin).

Asio otus wilsonianus (LESSON).

Some time since the present writer had occasion to investigate the subspecific status of *Asio otus wilsonianus* (Lesson).[1] This owl has for many years been commonly considered a distinct species, although known to be more or less closely related to *Asio otus* (Linnaeus)[2] of Europe. Even a cursory examination of a good series of both these birds shows that they are more intimately connected than has been supposed. The principal differences separating *Asio wilsonianus* from *Asio otus* consist in the darker upper parts, on which the blackish areas are more confusedly mottled with less inclination to a striped appearance; the less conspicuous ochraceous suffusion of both upper and lower surfaces; the rather more heavily streaked breast; and more heavily barred posterior lower parts. Although in size the two birds are alike, there is a great range of individual variation in the plumage of *Asio otus*, involving the existence of at least four color phases, these being a light and a dark ochraceous phase, and a light and a dark gray phase. The characteristics separating *Asio wilsonianus* are most striking when compared with the light ochraceous phase of *Asio otus*, but many specimens of the latter in the dark phase are not so different. In fact, not a few of the specimens in the series of *Asio otus* examined would be practically indistinguishable if placed, with their labels removed, among the American birds. While, of course, it is true that the average differences indicate

[1] *Otus wilsonianus* Lesson, Traité d'Ornith., 1830, p. 110 (New York).
[2] *Strix otus* Linnaeus, Syst. Nat., ed. 10, 1, 1758, p. 92 (Sweden).

that the two forms are readily separable, the two characters most relied upon—the darker and more confusedly mottled upper surface of the American bird, and its more heavily barred posterior lower parts—are not constant. In fact, in those respects we can find some examples of *Asio otus* from England and some from China that are but very slightly or not at all different from specimens of *Asio wilsonianus* taken in Utah, Nevada, and even the District of Columbia. The latter bird is still more like *Asio otus canariensis* Madarász. All of this of course, goes to prove that *Asio wilsonianus* is but a subspecies of *Asio otus*, as Dr. Ernst Hartert has recently claimed.[1] The American bird, therefore, should hereafter be called *Asio otus wilsonianus* (Lesson).

Scotiaptex nebulosa nebulosa (FORSTER).

In his recent account of the forms of the genus *Scotiaptex*, Mr. Robert Ridgway concludes[2] that the specimens of the Great Gray Owl from Alaska formerly identified as *Scotiaptex nebulosa lapponica* are but light-colored examples of *Scotiaptex nebulosa nebulosa* (Forster). A recent study of available material fully confirms Mr. Ridgway's opinion, which indicates that *Scotiaptex nebulosa lapponica* should be expunged from our North American list. The specimens from the delta of the Yukon River on which the North American record of this form was formerly based, are futhermore, no lighter than birds from Alberta in the collection of the Biological Survey in the United States National Museum, and are not to be distinguished subspecifically by either size or color from *Scotiaptex nebulosa nebulosa*. They are not even different enough to be considered intermediate between *Scotiaptex nebulosa nebulosa* and *Scotiaptex nebulosa barbata* (Pallas) from northeastern Siberia. In fact, the distinctness of *Scotiaptex nebulosa barbata* from *Scotiaptex nebulosa lapponica* of northern Europe is somewhat questionable, as the alleged differences appear to be based on individual or other unimportant conditions of plumage. We have not, however, examined a sufficient series from eastern Siberia definitely to settle this question even to our own satisfaction. A specimen from Verkhni Kloymsk in the Kolyma region of northeastern

[1] Vögel Paläarkt. Fauna, Heft VIII (Band II, Heft 2), Aug., 1913, p. 987.
[2] Bull. U. S. Nat. Mus., No. 50, VI, 1914, p. 635.

Siberia, recently recorded by Mr. J. H. Riley as *Scotiaptex nebulosa barbata.*[1] does not, so far as we can see, differ appreciably in any significant respect from *Scotiaptex nebulosa lapponica.*

Lanius ludovicianus mearnsi RIDGWAY.

The Shrike described as *Lanius ludovicianus mearnsi* by Mr. Ridgway[2] has not been recognized by recent authors. This has been due, apparently, to the supposition that the color of the upper tail-coverts was the principal, if not the only, character to separate *Lanius ludovicianus mearnsi* from *Lanius ludovicianus anthonyi* of Santa Cruz Island, California, and that this character was inconstant. Size was mentioned by Mr. C. B. Linton[3] as another supposed distinction, but this was not claimed by the original describer, as may be seen by reference to his description[4], since the present form was there not compared with *Lanius ludovicianus anthonyi*, but with *Lanius ludovicianus mexicanus.* Examination of a good series of both island forms from San Clemente and Santa Cruz islands shows that there are, however, excellent characters to distinguish *Lanius ludovicianus mearnsi.* The trenchantly white upper tail-coverts of *Lanius ludovicianus mearnsi* are an excellent average difference, even if not reliable in every individual, for the rump and upper tail-coverts in *Lanius ludovicianus anthonyi* are nearly always gray, sometimes pale, sometimes almost as dark as the lower back. Furthermore, *Lanius ludovicianus mearnsi* differs from *Lanius ludovicianus anthonyi* in somewhat darker upper parts, much more whitish lower surface, much more strikingly and extensively whitish scapulars, and much larger white spot on the base of the primaries. Birds from Santa Catalina Island, California, are intermediate, but without much doubt properly referable to *Lanius ludovicianus anthonyi.* All records of *Lanius ludovicianus mearnsi* from Lower California[5] belong probably to

[1] Proc. U. S. Nat. Mus., LIV, 1918, p. 617.

[2] *Lanius ludovicianus mearnsi* Ridgway, Proc. Biol. Soc. Wash., XVI, September 30, 1903, p. 108 (San Clemente Island, California).

[3] Condor, X, No. 4, August 28, 1908, p. 182.

[4] Ridgway, *loc. cit.*

[5] Ridgway, Bull. U. S. Nat. Mus., No. 50, III, 1904, p. 252.

other races, mostly to *Lanius ludovicianus nelsoni.*[1] The ranges of these two island forms are, therefore, as follows:

Lanius ludovicianus anthonyi: Santa Cruz, Santa Barbara, Anacapa, Santa Catalina, and probably Santa Rosa, islands, California.

Lanius ludovicianus mearnsi: San Clemente Island, California.

Vireo huttoni obscurus ANTHONY

Vireo huttoni obscurus was originally described by Mr. A. W. Anthony,[2] from a specimen obtained by him at Beaverton, Oregon. It is currently regarded as a dark form of *Vireo huttoni* from the Pacific Coast region of the northwestern United States and southwestern British Columbia. Its distinctness from *Vireo huttoni huttoni* was many years ago questioned by Mr. S. N. Rhoads,[3] and more recently by Anderson and Grinnell.[4] This vireo is not common in collections, and during the past ten years the writer has taken pains to examine carefully all specimens that have passed through his hands. Enough material has now accumulated from the States of Washington and Oregon to show that in neither breeding nor winter plumage is there the slightest difference in either size or color between the vireos of this species from these two States and those from southern California. The bird at present known as *Vireo huttoni obscurus* Anthony must therefore be synonymized with *Vireo huttoni huttoni* Cassin, and the range of the latter extended at least to northwestern Washington.

The large series of *Vireo huttoni* now available shows that this species is subject to great individual variation, which authors, including the writer, have not hitherto taken sufficiently into account. There are in this species two well-marked color phases which are not due to age, sex, or season. In one the upper parts are very decidedly greenish; in the other grayish, with little or no trace of olive green. Specimens of the latter character were

[1] *Lanius ludovicianus nelsoni* Oberholser, Condor, XX, No. 6, December 12, 1918, p. 209.

[2] Zoe, I, December, 1890 (January, 1891), p. 308.

[3] The Auk, X, No. 3, July, 1893, pp. 238–241.

[4] Proc. Acad. Nat. Sci. Phila., 1903, p. 12.

the basis of *Vireo huttoni oberholseri* Bishop, for the separation of which the present writer was unfortunately at least in part responsible. Of each of these two color phases there are also two patterns of coloration; one in which the upper parts are uniform, and the other in which the pileum is distinctly darker and usually more grayish, forming a well-defined cap. There are thus at least four fairly distinct styles of coloration, all of which might perhaps well be called phases. All are connected by various kinds of intermediates. There is, in addition to these color phases, also a great range of difference in the general shade of coloration on the upper parts, and unusually dark specimens have been apparently responsible for the supposed distinctness of *Vireo huttoni obscurus*. Birds in worn plumage are usually darker, duller, and somewhat less greenish above.

Vireo huttoni insularis RHOADS.

The Vireo described by Mr. S. N. Rhoads as *Vireo huttoni insularis*[1] has commonly been considered a synonym of *Vireo huttoni obscurus* Anthony. Since, however, as above shown, the latter is not separable from *Vireo huttoni huttoni*, it would seem as a matter of course that *Vireo huttoni insularis* would become a synonym of *Vireo huttoni huttoni*. In order, however, to make sure of this matter, the types now in the Provincial Museum of Victoria, British Columbia, together with all the other available material from Vancouver Island, including some specimens not seen by Mr. Rhoads when he described *Vireo huttoni insularis*, have been examined. Unfortunately for the status of *Vireo huttoni insularis*, none of the Vancouver Island or other British Columbia specimens can be satisfactorily separated from California birds from the region about San Francisco Bay. The male type of *Vireo huttoni insularis*, from Victoria, British Columbia, and another specimen from the same locality, appear at first sight to be somewhat darker both above and below than California examples, but this apparent difference is readily traceable to some accidental soiling of the plumage. These facts, together with the lack of any differences shown by other specimens from Vancouver Island, take away all the present claim that *Vireo huttoni insularis* has for recognition as a subspecies. It, therefore, should be considered a synonym of *Vireo huttoni huttoni*, and the range of that form thereby extended to include Vancouver Island.

[1] The Auk, X, No. 3, July, 1893, p. 239.

BIRD DISTRIBUTION IN EASTERN KENTUCKY.

BY R. E. HORSEY.

I HAVE had the pleasure during the past fifteen years of spending from ten days to three weeks, Spring and Fall in botanical collecting for our Rochester, New York, Parks, under the direction of Prof. C. S. Sargent, Director of the Arnold Arboretum, Harvard University, who receives duplicates of all the botanical specimens, seeds and plants obtained.

My interest in birds during the past eight years has led me to carefully record all that I have seen, having my bird glass handy at all times. My field for the past two years was eastern Kentucky including also a few visits across the Ohio River while studying the arborescent flora of Ohio.

In Kentucky along the Ohio River the country is more or less hilly but soon flattens out as one leaves the river in Greenup, Kenton and Boyd Counties, while in Clark and Madison Counties, the famous Blue Grass Region, it is level or rolling except along the Kentucky River where there are a few low hills. This however is all changed in passing to the southeast where we enter the hills, beautiful in their never ending variety of valleys and abrupt ridges clothed with forests of oak, maple, hickory and pine, edged with sassafras, and undergrown with dogwood and sumac, making a riot of color in the Autumn. The hill country of Johnson, Pike, Letcher, Breathitt and Lee Counties while an excellent place to pursue the study of the arborescent flora, is not so favorable for the ornithologist. The brushy pastures and stream sides of the level counties give the largest number of species of birds, but to me those of the hills are the most interesting because of their elusiveness.

The difference in elevation in eastern Kentucky affords a fine field for the study of plant distribution and this is true of bird life also. One striking example of trees is furnished by the Buckeyes; the Ohio Buckeye (*Aesculus glabra*) being the tree of the open country while the Sweet Buckeye (*Aesculus octandra*) is found only in the hills. Of course some trees may be found generally distributed also. The following notes will show the same differ-

ences in bird distribution, and as I hope to pay special attention to the hills and mountains of southeastern Kentucky during the year 1921 I trust I shall be able to throw still further light on this subject.

Podilymbus podiceps. PIED-BILLED GREBE.—One in a small pond west of Winchester, Clark Co. September 23, 1920.

Butorides virescens virescens. GREEN HERON.—One and two in Clark and Madison Counties, May and September.

Pisobia maculata. PECTORIAL SANDPIPER.—Four migrants in a wet meadow, Clark Co., May 13, 1920.

Actitis macularia. SPOTTED SANDPIPER.—One along the river in Breathitt Co. May 21, 1920.

Oxyechus vociferus. KILLDEER.—Fairly common in May, Clark and Madison Counties with thirty noted in Clark Co., September 23, 1920.

Zenaidura macroura carolinensis. MOURNING DOVE.—Noted in May, one to four birds, Clark, Madison and Boyd Counties.

Cathartes aura septentrionalis. TURKEY VULTURE.—One to six birds, Greenup, Clark, Madison and Pike Counties, spring and fall.

Circus hudsonius. MARSH HAWK.—One May 15, 1920, Madison Co.

Accipiter cooperi. COOPER'S HAWK.—One May 14, 1920, Madison Co.

Falco sparverius sparverius. SPARROW HAWK.—This useful small hawk noted a number of times in Greenup, Clark and Madison Counties but never more than two birds at a time.

Otus asio asio. SCREECH OWL.—One startled from a thicket May 15, 1920, Madison Co.

Coccyzus erythrophthalmus. BLACK-BILLED CUCKOO.—One May 11, 1920, Clark Co., and a dead bird found in the wooded hills May 19, 1920, Breathitt Co.

Ceryle alcyon alcyon. BELTED KINGFISHER.—One along a mountain stream in Letcher Co., October 4, 1920.

Dryobates villosus subsp.? HAIRY WOODPECKER.—One May 13, 1920, Clark Co.

Dryobates pubescens medianus. DOWNY WOODPECKER.—Two of these birds were noted May 18, 1920, in Breathitt Co. and as they were among the hills I believe they were the northern subspecies.

Melanerpes erythrocephalus. RED-HEADED WOODPECKER.—A fairly common bird in Clark, Madison and Boyd Counties, two were also noted among the hills in Breathitt Co., October 7, 1920.

Centurus carolinus. RED-BELLIED WOODPECKER.—In May recorded two in Clark and one in Madison Counties.

Colaptes auratus subsp.? FLICKER.—Of general distribution in eastern Kentucky, found in both the open counties and in the hills.

Chordeiles virginianus virginianus. NIGHTHAWK.—Noted twice in May, Madison Co.

Chaetura pelagica. CHIMNEY SWIFT.—A common summer bird throughout eastern Kentucky.

Archilochus colubris. RUBY-THROATED HUMMINGBIRD.—Observed in May in Boyd and Pike Counties.

Tyrannus tyrannus. KINGBIRD.—Recorded in May, Clark and Madison Counties.

Myiarchus crinitus. CRESTED FLYCATCHER.—Two birds May 19, 1920, in the wooded hills, Breathitt County.

Sayornis phoebe. PHOEBE.—In Clark, Madison and Boyd Counties.

Myiochanes virens. WOOD PEWEE.—Evidently a well distributed summer resident in eastern Kentucky.

Empidonax flaviventris. YELLOW-BELLIED FLYCATCHER.—One on May 12, 1919, Boyd Co.

Empidonax minimus. LEAST FLYCATCHER.—One on May 11, 1920, Clark Co.

Cyanocitta cristata cristata. BLUE JAY.—Fairly common in Spring, Clark, Madison and Johnson Counties.

Corvus brachyrhynchos brachyrhynchos. CROW.—Common in the Blue Grass Region and along the Ohio River but among the hills, only met in an open place planted in corn, Pike Co.

Dolichonyx oryzivorus. BOBOLINK.—Eight, May 13, 1920, Clark Co. and four September 16, 1920, Madison Co.

Molothrus ater ater. COWBIRD.—From one to three birds noted in spring, Kenton, Clark and Pike Counties.

Agelaius phoeniceus phoeniceus. RED-WINGED BLACKBIRD.—In suitable locations in Clark, Madison and Boyd Counties. A few in May with flocks from 500 to 1,000 in September and October.

Sturnella magna subsp.? MEADOWLARK.—Common in Kenton, Clark and Madison Counties but not seen in the hill counties.

Quiscalus quiscula aeneus. BRONZED GRACKLE.—Common in Kenton, Clark, Madison and Boyd Counties but only noted in the hills in Johnson Co. where there are a considerable number of open fields.

Astragalinus tristis tristis. GOLDFINCH.—Noted in May as a common bird in eastern Kentucky.

Passer domesticus. ENGLISH SPARROW.—This bird is well established in eastern Kentucky.

Passerculus sandwichensis savanna. SAVANNAH SPARROW.—Two birds only, May 13, 1920, Clark Co.

Zonotrichia leucophrys leucophrys. WHITE-CROWNED SPARROW.—Two May 12, 1919, in Boyd Co. and one May 13, 1920, Clark Co.

Zonotrichia albicollis. WHITE-THROATED SPARROW.—One [illegible] Co, May 12, 1920.

Spizella passerina passerina. CHIPPING SPARROW.—A co[illegible] mer resident in the eastern portion of the state.

Spizella pusilla pusilla. FIELD SPARROW.—Noted in M[illegible] Clark, Madison and Lee Counties but not more than four at a

Melospiza melodia melodia. SONG SPARROW.—Common in all counties visited.

Pipilo erythrophthalmus erythrophthalmus. TOWHEE OR CHEWINK.—This brush-loving bird was noted only in Kenton and Boyd Counties.

Cardinalis cardinalis cardinalis. CARDINAL.—Fairly common in eastern Kentucky.

Zamelodia ludoviciana. ROSE-BREASTED GROSBEAK.—One only May 12, 1920, Clark Co.

Passerina cyanea. INDIGO BUNTING.—Noted in May as a common bird.

Spiza americana. DICKCISSEL.—The only bird of this species I ever met with was perched on a low hedge bordering a pasture in the Blue Grass Region, and I was very fortunate in having an intimate study of him at close quarters. May 13, 1920, Clark Co.

Piranga erythromelas. SCARLET TANAGER.—A male in fine plumage, May 19, 1919, Breathitt Co. Tanagers, immature or female were also noted at times but I could not satisfy myself whether they were Scarlet or Summer Tanagers.

Progne subis subis. PURPLE MARTIN.—It is a pleasure to note the numbers of these birds in Eastern Kentucky, especially as they are barely holding their own in two small colonies in Monroe Co., N. Y. where I am at home.

Hirundo erythrogastra. BARN SWALLOW.—Fairly common in Greenup, Clark and Madison Counties.

Stelgidopteryx serripennis. ROUGH-WINGED SWALLOW.—A few noted in May; Madison, Lee, Johnson and Pike Counties. In Johnson Co. they were flying in and out of nesting holes in a cliff of crumbling stone only five or six feet above the roadway along Paint Creek.

Bombycilla cedorum. CEDAR WAXWING.—Twenty-five birds, May 12, 1920, in Clark Co. with several September 29, 1920, in Boyd Co.

Vireosylva olivacea. RED-EYED VIREO.—In the wooded hills during May, Johnson, Pike, Breathitt and Lee Counties with one record only in the open portion in Clark Co.

Vireosylva gilva gilva. WARBLING VIREO.—One on May 13, 1919, Boyd Co. and two May 19, 1920, Breathitt Co.

Lanivireo flavifrons. YELLOW-THROATED VIREO.—Two birds, Kenton Co., May 10, 1920.

Mniotilta varia. BLACK AND WHITE WARBLER.—May 12, 1920, Clark Co., May 20, 1920, Lee Co. and September 26, 1920, Madison Co. One bird at a time.

Dendroica aestiva aestiva. YELLOW WARBLER.—A few in May in about all counties visited.

Dendroica caerulescens caerulescens. BLACK-THROATED BLUE WARBLER.—One October 5, 1920, Letcher Co.

Dendroica coronata. MYRTLE WARBLER.—One September 6, 1920, Madison Co.

Dendroica magnolia. MAGNOLIA WARBLER.—May 11, 1920, Clark Co.

Dendroica pensylvanica. CHESTNUT-SIDED WARBLER.—Kenton Co., May 10, 1920, and Madison Co., May 14, 1920.

Dendroica castanea. BAY-BREASTED WARBLER.—September 29 and October 1, 1920, Boyd Co.

Dendroica striata. BLACK-POLL WARBLER.—May 13, 1920, Clark Co.

Dendroica fusca. BLACKBURNIAN WARBLER.—May 12 and 13, 1920, Clark Co.

Dendroica virens. BLACK-THROATED GREEN WARBLER.—Boyd Co. May 12, 1919.

Dendroica discolor. PRAIRIE WARBLER.—Boyd Co., May 11, 1919.

Seiurus noveboracensis noveboracensis. WATER-THRUSH.—Two May 19, 1920, Breathitt Co.

Geothlypis trichas trichas. MARYLAND YELLOW-THROAT.—Well distributed in all Eastern Kentucky, noted in May.

Icteria virens virens. YELLOW-BREASTED CHAT.—In May and September, Boyd, Clark and Madison Counties.

Wilsonia citrina. HOODED WARBLER.—October 5, 1920, Letcher Co.

Setophaga ruticilla. REDSTART.—Noted in most counties visited from May 10 to 19.

Mimus polyglottos polyglottos. MOCKINGBIRD.—Clark, Madison and Pike Counties.

Dumetella carolinensis. CATBIRD.—Common in Eastern Kentucky.

Toxostoma rufum. BROWN THRASHER.—In May several in the level counties but only noted in the hills in Lee Co., May 20, 1920.

Thryothorus ludovicianus ludovicianus. CAROLINA WREN.—Fairly common in all counties visited.

Thryomanes bewickii bewickii. BEWICK'S WREN.—I had the pleasure of my first acquaintance with this sprite in tangled underbrush near the Ohio River, Greenup Co., May 24, 1917, one was also noted May 12, 1920, Clark Co.

Troglodytes aedon aedon. HOUSE WREN.—Noted in May, Greenup, Kenton and Johnson Counties.

Baeolophus bicolor. TUFTED TITMOUSE.—Among the wooded hills in Pike and Breathitt Counties. Noted in May.

Penthestes carolinensis carolinensis. CAROLINA CHICKADEE.—Two at a time noted in May, Greenup, Johnson, Clark and Madison Counties and October 3, 1920 Pike Co.

Hylocichla mustelina. WOOD THRUSH.—Noted in May, Greenup, Kenton and Boyd Counties in the low wooded hills along the Ohio River as well as in Johnson, Pike and Breathitt Counties in the true hill country.

Hylocichla fuscescens fuscescens. VEERY OR WILSON'S THRUSH.—May 26, 1917, Greenup Co., May 12, 1919, Boyd Co., May 12, 1920, Clark Co. and May 14, 1920, Madison County.

Hylocichla ustulata swainsoni. OLIVE-BACKED THRUSH.—May 19, 1920, among the hills in Breathitt Co.

Planesticus migratorius migratorius. ROBIN.—A common bird May 8 to 23 and September 23 to 26, in the level counties but three only seen about the town of Jackson, Breathitt Co., May 19, 1920, and not found elsewhere in the hills

Sialia sialis sialis. BLUEBIRD.—Several noted in about all counties visited.

Highland Park, Reservoir Ave., Rochester, N. Y.

A NEW BURROWING OWL FROM COLOMBIA.

BY WITMER STONE.

IN a collection of Colombian birds recently received by the Academy of Natural Sciences of Philadelphia from Mr. M. A. Carriker, Jr., are two specimens of a Burrowing Owl which appear to represent an undescribed form.

They are nearest geographically to *Speotyto cunicularia tolimae* described by the writer[1] from the plains of Tolima, but curiously enough while that form is the darkest Burrowing Owl that I have seen from South America the present is among the lightest. It may be described as follows:

Speotyto cunicularia carrikeri subsp. nov.

Type. No. 73700 Coll. Acad. Nat. Sci., Philadelphia. Palmar, Boyaca, Colombia. April 24, 1917, coll. M. A. Carriker, Jr.

Description. Resembles almost exactly in general coloration specimens of *S. c. hypogaea*, from California, and similar to the large pale birds of southern South America, but it is of about the same dimensions as the small dark colored *S. c. tolimae* of Colombia.

The outermost tail feathers are white with remains of four dusky bars mainly on the outer web and reduced to a mere streak in the case of the uppermost; on the next three pairs the bars are broad and well defined on the outer web, but the inner web is largely buffy white, the distal bars sometimes partly developed. The outer feathers are equally barred on both webs.

This bird is much worn and the light spots above and on the wings are white.

The other example (No. 73699) is marked as a female and is distinctly tawny, the tail more heavily barred and all light spots on tail, wings and back, strongly suffused with tawny. There is, however, in neither specimen a suggestion of the almost chocolate brown of *S. c. tolimae.*

The type measures as follows: Wing 173 mm, tail 78, tarsus 46. exposed culmen (from cere) 14.

[1] Stone, Proc. Acad. Nat. Sci., Phila., 1899. p. 304.

THIRTY-NINTH STATED MEETING OF THE AMERICAN ORNITHOLOGISTS' UNION.[1]

BY T. S. PALMER.

THE Thirty-ninth Stated Meeting of the American Ornithologists' Union was held at the Academy of Natural Sciences in Philadelphia, Pa., November 7–10, 1921. The business sessions on the opening day were held in the council room and the library and the public sessions on the following days in the lecture hall of the Academy. The meeting was largely attended and with excursions on Friday and Saturday occupied the entire week.

Attendance.—The total attendance of Fellows, Members, Associates and visitors was about 125. The Fellows present numbered 25 and included two Founders, Charles F. Batchelder and Dr. A. K. Fisher; the Retired Fellows were represented by Dr. W. K. Fisher and Newbold Lawrence and the Corresponding Fellows by Dr. W. L. Abbott and Mr. H. Kirke Swann; the list of Members including those elected at this meeting contained 24 names (See p. —). Among those who attended from a distance were Dr. W. K. Fisher from California, Dr. T. S. Roberts from Minnesota, W. E. Saunders, P. A. Taverner, J. H. Fleming and Hoyes Lloyd from Canada, H. Kirke Swann from London, England, and included in the list of guests were Mr. and Mrs. Adolph Burdet and Miss Bandet of Overveen, Holland.

Business meetings.—The first day was devoted to two sessions of the Council at 10.15 a. m. and 2.15 p. m., a meeting of the Fellows at 4 p. m., and a meeting of Fellows and Members at 8.15 p. m.

By order of the Council Dr. F. A. Lucas, at his own request, was

[1] This was the sixth meeting held in Philadelphia and many changes were apparent since the Union first convened there in 1890 in a meeting memorable on account of the presence of Dr. Samuel W. Woodhouse, the founding of the fourth Code, and the first visit paid by the members to the home of Audubon. The Union then had 784 members, including 48 Active, 17 Honorary, 46 Corresponding and 673 Associate. Outstanding features of the program were several papers on glaciers and moas. 5 papers illustrated by lantern slides and the reports of the various members of the Harriman Alaska Expedition. See 'The Auk,' Vol. XVIII, pp. 75–93. Dr. Woodhouse and nine of the members, including three Founders, who presented papers or took part in the discussions are no longer living and the number of Founders now present at a meeting is so small as to not warrant special comment.

transferred to the list of Retired Fellows. The report of the Committee on the Brewster Memorial Medal was read and after full consideration the medal was awarded to Robert Ridgway in recognition of his work on the 'Birds of North and Middle America,' volume VIII of which was in the judgment of the Council, the most meritorious publication on the birds of America which had appeared during the past two years.

At the meeting of the Fellows four of the five vacancies were filled by the election of Dr. Glover M. Allen of Boston, Dr. W. H. Bergtold of Denver, Allan Brooks of Okanagan Landing, B. C., and James P. Chapin of New York

At the meeting of the Fellows and Members 23 Fellows and 16 Members were present. Following the roll call and reading of the minutes of the previous meeting, the report of the Secretary was presented showing that the total membership was about 1350. (For details see p. . .) The report of the Treasurer which had been verified by the auditors was then presented and showed the finances of the Union in a satisfactory condition. The number of members in arrears was less than 6 per cent. of the total number and the amount of unpaid dues was the smallest in the history of the Union.

The election of officers resulted in the re-election, with a single exception, of the officers of 1921 as follows: President, Witmer Stone; Vice presidents, George Bird Grinnell and Jonathan Dwight; Secretary, T. S. Palmer; Treasurer, W. L. McAtee; Members of the Council, A. C. Bent (vice F. A. Lucas retired), Ruthven Deane, Joseph Grinnell, H. C. Oberholser, W. H. Osgood, Charles W. Richmond, and T. S. Roberts.

On recommendation of the Council five Honorary Fellows, 14 Corresponding Fellows and 250 Associates were duly elected. In the election of 5 Members, Ohio was represented by S. Prentiss Baldwin and George L. Fordyce; Illinois by Dr. Casey A. Wood; New Jersey by Charles H. Rogers and the District of Columbia by F. C. Lincoln. Fellows, Honorary Fellows and Members are transferred from other classes while Corresponding Fellows and Associates being elected from candidates outside the Union made the actual increase in membership 264, one of the largest on record. As a result of the election there is no vacancy in the list

of Honorary Fellows, a condition which has not previously existed since 1890, the class of Fellows contains only a single vacancy, while there are 6 vacancies among the Corresponding Fellows and 8 in the class of Members.

The Committee on Biography and Bibliography through its chairman, Dr. Palmer, presented a brief report showing progress in various lines of work during the year. A bibliographical investigation of more than ordinary interest has been undertaken as a result of an inquiry from Lord Rothschild regarding the original 1848 edition of the report by Titian Peale on the Ornithology of the Wilkes Exploring Expedition. Of this celebrated work only 100 copies were published and of these only a few have been located in the United States and three abroad. Through the cooperation of Mr. Harry Harris a biographical index of 'The Ibis' covering the 60 volumes of the first ten series has been prepared and two copies in manuscript are in the hands of the Secretary. By means of this index it is possible to refer to any note in 'The Ibis' which contains biographical matter or which throws light on the activities of field collectors. The main efforts of the committee have been devoted to the preparation of the new 'Ten Year Index of The Auk,' a work which is in the hands of a special Auk Index Committee of eight members. Through the cooperation of the Biological Survey the material covering these volumes in the files of that office has been utilized as a basis. The slips containing the entries for each volume have been distributed to the members, independently checked and corrected, and most of them returned. When all of this material has been checked it will be arranged in a single alphabet and put in shape for publication.

Resolutions were adopted expressing the thanks of the Union to the Academy of Natural Sciences, the Zoological Society of Philadelphia, the Delaware Valley Ornithological Club, and to Mr. Joseph Y. Jeanes of Philadelphia for the loan of a series of original Audubon paintings for exhibition at the meetings.

Public meetings.—The meetings devoted to the presentation and discussion of scientific papers occupied the three days, November 8, 9 and 10, from 10 a. m. to 5 p.m. with an hour or more of intermission for luncheon which was served each day in the library of the Academy. The meeting on Tuesday opened with an address

of welcome by President John Cadwalader of the Academy of Natural Sciences who referred to Philadelphia and the Academy as a center of early scientific work. A brief response on behalf of the Union was made by the President, Dr. Witmer Stone. The program included 41 papers on a wide range of subjects relating mainly to American birds, including their distribution, migration, life history and nomenclature. An interesting contribution relating to Old World birds was presented in motion pictures by Mr. Adolph Burdet showing the life history of birds on some of the reservations on the coast of Holland.

The contributions of chief interest were a number of papers on the birds of the Neotropical region, reports on recent work in banding birds, and the discussion of vernacular names and problems of field identification. R. N. Davis' illustrated account of 'Bird Collecting in Panama,' Chapman's 'Distribution of Bird Life in Ecuador,' Mrs. Reichenberger's 'Remarks on the Avifauna of Matto Grosso, Brazil,' and Wetmore's 'Bird Life of the Chaco' presented a series of pictures of birds of widely separated areas from Panama to Patagonia, Murphy's accounts of the condor, frigate bird and penguins, Miller's remarks on the Ramphocaenidae and Griscom's discussion on the House Wrens of South America directed attention to groups of special interest. Regional papers dealing with North America included Stuart's 'Breeding Birds of the Saskatchewan,' Street's 'Water Birds of the New Jersey Coast,' Harper's 'Birds of the Okefinokee Swamp' and Pennock's 'Habits of the Florida Burrowing Owl.'

The Reports of Lincoln and Baldwin presented summaries of recent work in banding birds and brought out some of the possibilities in this field of observation. Baldwin found in banding Towhees at Thomasville, Ga., that the colors of the eyes grade so imperceptibly from red through yellow to white that no sharp line of demarcation between the extremes could be drawn. His remarks on the mating of the House Wren and his conclusions that these birds normally remain mated for a period of only six weeks led to a general discussion on the subject of mating.

Nomenclature received perhaps less attention than usual. Oberholser exhibited the first part of the manuscript of the new Check List of African birds prepared by W. L. Sclater as one of

the parts of the 'Systema Avium,' and a list of names of Australian birds to be submitted at the annual meeting of the Royal Australasian Ornithologist's Union. Rogers in presenting some 'Suggestions in regard to Vernacular Names,' advocated the same designation for the same species in America and England, the suppression of pedantic names and questioned the utility of subspecific names in vernacular terminology. The general discussion which followed was summed up by the President who called attention to the fact that common names cannot be established unless they follow custom, cumbersome names should be simplified, and when no short vernacular designation is available the name which has the most usage in literature should be the one adopted.

The losses through death which the Union had sustained during the year were the occasion for an unusual number of memorial addresses. Osgood reviewed the life and work of Charles B. Cory; Chapman paid a tribute to Dr. J. A. Allen, his devotion to scientific work and his long service in behalf of the Union; and Richmond prepared a memorial on William Palmer which, however, was only read by title. Biographical sketches of Edwin Carter of Colorado and William A. Werner of Pennsylvania, two little known naturalists who died some years ago, were presented by F. C. Lincoln and H. S. Regar.

Moving pictures which were employed to illustrate seven different papers occupied the greater part of two afternoon sessions and served to show not only many important details in the life history of birds but new ways in which this form of illustration can be utilized in the study of ornithology.

Most of the technical papers were presented at the session on Thursday morning and proved of considerable interest. By restricting authors to the limits assigned on the program time was gained for discussion which was more general than usual, but even with long sessions it was necessary to read half a dozen papers merely by title.

Other events.—The social gatherings of the Union included a conversazione in the library of the Academy of Sciences on Tuesday evening, the annual dinner at 'The Roosevelt' on Wednesday evening, a visit to the Zoological Gardens on Friday and a trip to the Pine Barrens in the vicinity of New Lisbon, New Jersey, on Saturday.

At the Tuesday evening meeting a number of early unpublished drawings of Audubon, loaned for the occasion by Mr. Joseph Y. Jeanes, and some of the historic manuscripts and rarer illustrated works on birds belonging to the Academy were placed on exhibition for the benefit of the members. The entertainment at the annual dinner was furnished by members of the Delaware Valley Ornithological Club and after dinner speaking began with remarks by Samuel Scoville, Jr., and some ornithological reminiscences by Dr. Spencer Trotter. The company was then entertained by the entrance of Alexander Wilson followed by John James Audubon and C. S. Rafinesque, each of whom clad in characteristic costume commented in turn on the progress in ornithology and the changes which had occurred since the days when they were active. At the meeting on Friday the members of the Union were guests of the Zoological Society at luncheon and a record was made of the visit to the Philadelphia Zoological Gardens by the first moving picture ever taken of the members. Rain on Saturday interfered somewhat with the outing to the Pine Barrens but in spite of the unfavorable weather a party of about 30 made the trip and were rewarded by seeing a number of characteristic autumn birds.

Results.—The tangible results of the business meetings included the first public award by the Union of a medal for meritorious scientific work in ornithology and a definite authorization of the new 'Ten Year Index of The Auk.' The results of the scientific meetings crystallize slowly and are more difficult to summarize. Data already obtained through banding birds indicate that some ideas now prevalent in regard to migration and mating require revision and a study of some of the films demonstrated the value of the moving picture camera in correcting certain erroneous ideas as to movements or functions of the feet or bill, particularly in woodpeckers and other species. Attention was called to the possibility of distinguishing the sex of birds in the field by habits and action even in such species as the House Wren in which distinguishing sex markings of the plumage are absent. Most important of all was the demonstration in several of the papers of the necessity of adopting modern methods and focusing every available source of information and mechanical device on the problem in hand whether it be a question of migration, distribution or the revision of a group.

Thanks to the efficiency of the local Committee of Arrangements the Philadelphia meeting was pronounced one of the most successful meetings of recent years in spite of the handicaps of Election Day, high railroad rates and unfavorable weather for the excursion which prevented the attendance of several members.

The next annual meeting will be held at the Field Museum, Chicago, in October 1922. This will be the first meeting in the Middle West and it is hoped to make it the occasion of bringing together many members in the Mississippi Valley who have been unable to attend the meetings in the East.

PROGRAM.

(Papers are arranged in the order in which they were presented at the meetings. Those marked with an asterisk (*) were illustrated by lantern slides.)

TUESDAY.

1. In Memoriam—CHARLES BARNEY CORY. W. H. OSGOOD, Chicago, Ill. (45 min.).
2. *Observations on some Water Birds of the New Jersey Coast. J. FLETCHER STREET, Beverly, N. J. (15 min.).
3. Paintings showing the Metallic Colors of Birds. FRANK BOND, Washington, D. C. (5 min.).
4. Notes on the Habits and Sex Plumage of the Florida Burrowing Owl. C. J. PENNOCK, Kennett Square, Pa. (15 min.).
5. *Birds of the Okefinokee Swamp, Georgia. FRANCIS HARPER, Ithaca, N. Y. (20 min.).
6. *On Some of the Breeding Birds of the Saskatchewan. GEO. H. STUART, 3RD, Philadelphia, Pa. (20 min.).
7. *Notes on Edwin Carter, a prominent Naturalist of Colorado. F. C. LINCOLN, Washington, D. C. (10 min.).
8. The Wild Life School at McGregor, Iowa. GEORGE BENNETT, Iowa City Ia. Presented by HARRY C. OBERHOLSER. (15 min.).
9. *Bird Life of the Chaco. ALEXANDER WETMORE, Washington, D. C. (20 min.).
10. *Bird Collecting in Panama. R. N. DAVIS, Scranton, Pa. (45 min.).
11. *The Andean Condor as a Coastal Bird. ROBERT CUSHMAN MURPHY. (10 min.).
12. *The Status of Cory's Shearwater. ROBERT CUSHMAN MURPHY. (15 min.).
13. *The Distribution of Bird-Life in Ecuador. FRANK M. CHAPMAN. (20 min.).

WEDNESDAY MORNING.

14. Progress in Bird Banding. F. C. LINCOLN, Washington, D. C. (20 min.).
15. Bird Banding Notes of 1921. S. PRENTISS BALDWIN, Cleveland, Ohio. (30 min.).
16. In Memoriam—Joel Asaph Allen. FRANK M. CHAPMAN, New York. (45 min.).
17. The Problem of Field Identification. LUDLOW GRISCOM, New York. (20 min.).

WEDNESDAY AFTERNOON—NOS. 19–22, MOTION PICTURES.

18. *An Appreciation of William A. Werner, a little known Pennsylvania Naturalist. H. SEVERN REGAR, Norristown, Pa. (15 min.).
19. A New Use for Motion Pictures of Birds. ARTHUR A. ALLEN, Ithaca, N. Y. (40 min.).
20. Bird Life in Holland. ADOLPH BURDET, Overveen, Holland. (40 min.).
21. Studies of Some Familiar Birds in Motion Pictures. THOS. S. ROBERTS, Minneapolis, Minn. (40 min.).
22. Views of Western Bird Life, by Wm. L. Finley. Presented by T. GILBERT PEARSON, New York. (20 min.).

THURSDAY.

23. Some Remarks on the Avifauna of Matto Grosso, Brazil. MRS. ELSIE M. B. REICHENBERGER, New York. (20 min.).
24. The Classification of the Woodpeckers and their Allies. W. DE W. MILLER, New York. (30 min.).
25. The Distribution of the House Wrens of the Genus *Troglodytes*. FRANK M. CHAPMAN and LUDLOW GRISCOM, New York. Presented by MR. GRISCOM. (20 min.).
26. (a) A New Family of Neotropical Birds, the Ramphocaenidae. (10 min.).
 *(b) A Suggestion as to the Origin of Diastataxy. W. DEW. MILLER, New York. (10 min.).
27. Yellowleg Skeletons. Illustrated by Chart. J. T. NICHOLS, New York. (15 min.).
28. Check Lists Abroad. HARRY C. OBERHOLSER, Washington, D. C. (15 min.).
29. Suggestions in regard to Vernacular Names. CHARLES H. ROGERS, Princeton, N. J. (20 min.).
30. Greetings from England. H. KIRKE SWANN, London. ((5 min.).
31. *Experience in Bringing up a Family of Bluebirds. MISS M. W. DALEY, Sleighton Farm, Pa. (15 min.).
32. Distributional Notes on American Water Birds. Motion Pictures and other Illustrations. ROBERT CUSHMAN MURPHY. (40 min.).
33. Motion Pictures illustrating the Home Life of Some Pennsylvania Birds. ERNEST COURTS, Buck Hill, Pa. (45 min.).

34. Bird Life in American Zoological Gardens. Illustrated by Motion Pictures. ARTHUR H. FISHER, Washington D. C. (45 min.).
35. Ten Summers' Observations of Birds near Slide Mountain in the Catskills. MISS M. W. DALEY, Sleighton Farm, Pa. (Read by title.)
36. In Memoriam—William Palmer. CHAS. W. RICHMOND, Washington, D. C. Presented by HARRY C. OBERHOLSER. (Read by title.)
37. Identifying the Ducks of the Eastern United States at long range. LUDLOW GRISCOM, New York. (Read by title.)
38 *Discontinuuous Distribution as illustrated by the Species of the Genus *Diglossa*. FRANK M. CHAPMAN, New York. (Read by title.)
39. Our English Nomenclature. A. D. DUBOIS, Springfield, Ill. (Read by title.)
40. Some Observations on the Coast of Brazil. GEO. W. FIELD, Washington, D. C. (Read by title.)
41. *Notes on Nesting Habits of Some Massachusetts Duck Hawks. S. WALDO BAILEY, Pittsfield, Mass. (Read by title.)

FELLOWS AND MEMBERS PRESENT.

FELLOWS—Outram Bangs, W. B. Barrows, C. F. Batchelder, A. C. Bent, F. M. Chapman, Jonathan Dwight, A. K. Fisher, Geo. B. Grinnell, J. H. Fleming, E. H. Forbush, L. A. Fuertes, W. L. McAtee, W. DeW. Miller, R. C. Murphy, H. C. Oberholser, W. H. Osgood, T. S. Palmer, C. W. Richmond, T. S. Roberts, John H. Sage, W. E. Saunders, Witmer Stone, P. A. Taverner, W. E. C. Todd, Alexander Wetmore—Total 25.

RETIRED FELLOWS—W. K. Fisher, N. T. Lawrence.

CORRESPONDING FELLOWS—W. L. Abbott, H. Kirke Swann.

MEMBERS—A. A. Allen, Vernon Bailey, Mrs Vernon Bailey, W. L. Baily, S. Prentiss Baldwin, Thomas Barbour, Frank Bond, F. L. Burns, E. A. Goldman, Ludlow Griscom, Francis Harper, A. H. Howell, F. C. Lincoln, G. S. Morris, J. T. Nichols, T. G. Pearson, C. J. Pennock, J. L. Peters, J. C. Phillips, S. N. Rhoads, C. H. Rogers, B. H. Swales, C. W. Townsend, Spencer Trotter.—Total 24.

ELECTION OF FELLOWS, MEMBERS, AND ASSOCIATES.

FELLOWS:

DR. GLOVER MORRILL ALLEN, 234 Berkeley St., Boston Mass.

DR. WILLIAM HARRY BERGTOLD, 1159 Race St., Denver, Colo.

ALLAN CYRIL BROOKS, Okanagan Landing, B. C.

JAMES PAUL CHAPIN, Am. Mus. Nat. Hist., New York City.

HONORARY FELLOWS:

ARCHIBALD JAMES CAMPBELL, "Bulgaroo," Broughton Road, Surrey Hills, Victoria, Australia.

DR. WILLIAM EAGLE CLARKE, Royal Scottish Museum, Edinburgh, Scotland.

REV. FRANCIS CHARLES ROBERT JOURDAIN, Appleton Rectory, Abingdon Berks, England.

JOHN HENRY GURNEY, Keswick Hall, Norwich, England.

NAGAMICHI KURODA, Fukuyoshi Cho, Akasaka, Tokyo, Japan.

CORRESPONDING FELLOWS:

WILFRID BACKHOUSE ALEXANDER, Inst. Science and Industry, William St., Brisbane, Queensland, Australia.

THOMAS CARTER, Wensleydale, Mulgrave Road, Sutton, Surrey, England.

ABEL CHAPMAN, care Zoological Society, Regents Park, London, N. W. 8, England.

TADEUSZ CHROSTOWSKI, Nacedova Museum, Przyodnieze, Krakowski-Przedmiescie 26–28, Warsaw 1, Poland.

HENRY JOHN ELWES, Colesborne, Cheltenham, Gloucestershire, England.

DR. ALESSANDRO GHIGI, R. Università, Bologna, Italy.

JOHN DAVID DIGUES LA TOUCHE, The Lodge, Glendalough County Wexford, Ireland.

GEORGE EDWARD LODGE, Hawkhouse, Park Road, Camberley, Surrey, England.

HERMANO APOLINAR MARIA, Instituto de la Salle, Bogota, Colombia.

ARTHUR HERBERT EVELYN MATTINGLY, Custom House, Melbourne, Victoria, Australia.

COL. RICHARD MEINERTZHAGEN, 63 Bedford Gardens, Kensington, W. S., London, England.

DR. ALIPIO de MIRANDA RIBEIRO, Therigopolis, Estado de Rio Janeiro, Brazil.

DR. VICTOR GURNET LOGAN VAN SOMEREN, care Medical Dept., Box 140, Nairobi, Brit. East Africa.

HUGH WHISTLER, care King, King & Co., Bombay, India.

MEMBERS:

[1]SAMUEL PRENTISS BALDWIN, Williamson Bldg., Cleveland, Ohio.

GEORGE LINCOLN FORDYCE, 40 Lincoln Ave., Youngstown, Ohio.

FREDERICK CHARLES LINCOLN, Biological Survey, Washington, D. C.

[1] CHARLES HENRY ROGERS, Nassau Inn, Princeton, N. J.

[1] DR. CASEY ALBERT WOOD, 7 W. Madison St., Chicago, Ill.

ASSOCIATES:

The list of Associates contains 250 candidates. These names are omitted here to save space as they will appear in the annual Directory of Members in 'The Auk' for April.

[1] Life members.

REPORT OF THE SECRETARY.

BY T. S. PALMER.

In spite of serious handicaps inevitable in a period of reorganization and reconstruction such as that through which we are now passing, the year 1921 has been one of the most prosperous in the history of the Union. The membership is larger than ever before and losses through resignation and delinquency have been small. The net gain after deducting all losses on account of death, resignation, delinquency and failure to qualify was 209 members. We have been in correspondence with organizations and ornithologists in other lands and are keeping in touch with such projects as the 'Systema Avium' undertaken by the British Ornithologists' Union and the new 'Check List of Birds' of Australia which is being prepared by the Royal Australasian Ornithologists' Union. Work has been begun on a new decennial index of 'The Auk' and for the first time the Union is in a position to award a medal for meritorious work on American birds.

Membership.—The present membership of the Union is approximately 1350 with at least one representative in every State except Mississippi; in Alaska, Hawaii, the Phillipines; six Provinces of Canada and a number of foreign countries. In November 1920 the total membership was 1142. The distribution in each year is shown by the following statement:

Year	Fellows	Retired Fellows	Honorary Fellows	Corresponding Fellows	Members	Associates	Total
1921	46	4	20	80	91	1110	1351
1920	49	3	19	75	86	910	1142

The gain during the year comprised the election of 13 Corresponding Fellows and 306 Associates at the last annual meeting but this apparent increase of 319 was offset by the loss of more than 100 members, including 19 by death, 19 by resignation, 30 by failure to qualify and 42 by delinquency. The deaths, counting 5 which occurred in previous years, but news of which was delayed included those of 3 Fellows, 1 Honorary Fellow, 6 Corresponding Fellows and 9 Associates.

The effort to increase the number of life members has made some progress but not as much as was anticipated and has been offset by the loss through death of 1 life Fellow and 1 life Associate. The Union has nearly 50 life members including 5 Fellows, 7 Members and more than 30 Associates. The foreign membership includes 20 Honorary Fellows and 80 Corresponding Fellows. During the year special efforts were made to obtain information regarding several Corresponding Fellows who had not been heard from for some time. After considerable correspondence extending over a period of many months information was finally obtained from Russia regarding some of our Fellows in that country who had been out of reach of communication since the war, with the result that deaths were reported of Sergius N. Alpheraky, and Dr. Valentin L. Bianchi, both of Petrograd. Through the kind offices of the Greek Legation in Washington news was also obtained of the death of Dr. Theobald J. Kruper of Athens, Greece.

Service.—In addition to answering a large number of miscellaneous inquiries and requests of various kinds, efforts have been made to assist members and public libraries in completing sets of 'The Auk' and in furnishing full names and biographical data regarding members or other ornithologists.

The Journal.—The total number of complete sets of 'The Auk' now known is 185 of which 76 are in public libraries and 109 in private ownership. It seems doubtful whether the total can be very greatly increased. Several owners of complete sets have died recently and their sets have changed hands or have become dispersed. At present there are at least 6 complete sets (only one of which belongs to the Union) and several incomplete sets on the market.

Objects of the Union.—Recently some study has been given by the Secretary to the objects of the Union as set forth in the certificate of incorporation. These are briefly stated as:

1. The advancement of the members in ornithological science;
2. Publication of a journal of ornithology;
3. Acquisition of a library;
4. Care and collection of materials relating to the above objects.

The Union has thus far confined its energies to the first two objects and has made no effort to acquire a library or a collection.

The progress of its journal, 'The Auk', has been reported from time to time and the details regarding the volume for the present year have been given by the editor.

The 'advancement of the members in ornithological science' offers a problem which may well command the serious thought and best energies of the Union. With the present high cost of paper and printing it may be questioned whether anything will do more to advance the interests of the membership than to provide a medium of publication with reasonable promptness for investigations of the members. Aside from the larger special books and reports and the publications of the larger museums, most of the shorter papers and notes on birds now appear in periodical literature. During the year 1920 the number of octavo pages of leading American ornithological journals was 1682, distributed as follows: Auk 677; Bird Lore 428; Cassinia 55; Condor 218; Oologist 146; and Wilson Bulletin 158.

An increase of 300 pages would go far toward relieving the pressure for the publication of most of the shorter contributions now awaiting printing, or if 'The Auk' could be increased by even 100 pages it would provide a medium for many of these papers. The printing of State lists presents a more difficult problem but in spite of high prices the Cooper Ornithological Club has successfully issued an excellent list of the Birds of Montana, the Geological and Natural History Survey of South Dakota has recently published a paper on the birds of that State; the Birds of California by W. L. Dawson is now appearing in parts, and a report on the Birds of Alabama is in course of publication by the Biological Survey. There are now in manuscript awaiting printing, reports on the birds of New Mexico and Texas and in the near future manuscript lists of birds of several other States will doubtless be ready for publication. No comprehensive lists of the birds of Florida, Georgia, Kentucky, Mississippi, North Dakota, Oklahoma or Tennessee have thus far appeared, while the lists for Idaho, Maryland, Minnesota, Nevada, Oregon, Pennsylvania and Utah were published more than 20 years ago and require revision in the light of modern methods and present information.

Many years ago the Union established the nucleus of a research fund the income of which was not to become available until the

principal reached the sum of $5000. This limit has not as yet been attained but it is highly desirable that during the coming year, if possible, contributions be made to this fund to bring it up to the requisite amount and thus make available for current needs an income amounting to $250 annually or $500 biennially. Only recently an opportunity to cooperate in a valuable piece of research work has been lost through lack of a small sum which might have been provided had the income of this fund been available.

Activities of Members Abroad.—During the past year two of our members who have been residing abroad, Zimmer in British Papua and N. Gist Gee in China, and Beebe, Field, Peters and Wetmore who have been in South America, have returned home. Bullock has spent some time in Argentina, Beck is still collecting in the South Pacific, Cherrie has been at work in Ecuador, Raven has recently undertaken work in Australia, and Dr. Casey A. Wood has sailed for Barbados. One of the Corresponding Fellows, M. J. Delacour left for the West Indies and Venezuela in September, last summer Rev. F. C. R. Jourdain headed an expedition sent out by the University of Oxford to Spitzbergen, and in Africa Geo. L. Bates has been conducting explorations in northern Cameroon in the vicinity of Lake Chah.

DECEASED MEMBERS, 1920–1921

JOEL ASAPH ALLEN,[1] Founder and first President, aged 83, died at Cornwall on Hudson, N. Y., August 29, 1921.

CHARLES BARNEY CORY,[2] Fellow, died in his 65th year at Ashland, Wis., July 29, 1921.

WILLIAM PALMER,[3] Fellow, died in his 65th year in New York City, April 8, 1921.

ALPHONSE JOSEPH CHARLES DUBOIS, Honorary Fellow, aged 82, died at Coxyde sur Mer, Belgium, June 1, 1921.

SERGIUS NICKOLAEVICH ALPHERAKY,[4] Corresponding Fellow, aged 68, died at Petrograd, Russia in 1918.

VALENTIN LVOVICH BIANCHI,[5] Corresponding Fellow, died in his 63rd year at Petrograd, Russia, Jan. 10, 1920.

[1] For obituary notice, see Auk, XXXVIII, pp. 490–492.
[2] " " " see Auk, XXXVIII, pp. 492–493.
[3] " " " see Auk, XXXVIII, pp. 493–494.
[4] " " " see Auk, XXXVIII, p. 495
[5] " " " see Auk, XXXVIII, pp. 497–498.

HENRY WEMYSS FEILDEN,[1] Corresponding Fellow, died in his 83d year at Burwash, England, June 18, 1921.

THEOBALD JOHANNES KRUPER, Corresponding Fellow, died in his 92d year at Athens, Greece, March 23, 1921.

FREDERICK HERSCHEL WATERHOUSE,[2] Corresponding Fellow, died in his 74th year in London, England, March 12, 1919.

MRS. W. H. BARROWS, Associate, (elected in Nov. 1920), died at Pittsfield, Mass., in January, 1921.

WILLIAM JAMES BENNETTS,[3] Associate, aged 55, died at Washington, D. C., Sept. 13, 1920

STEWARDSON BROWN,[4] Associate, died in his 54th year in Germantown, Philadelphia, Pa. Mar.ch 14 1921.

DUDLEY BOWDITCH FAY, Associate, aged 61, died at Boston, Mass., Feb. 7, 1921.

WILLIAM HENRY FOX, Associate, aged 64, died at Washington, D. C., Nov. 3, 1921.

NATHANIEL ATWOOD FRANCIS, Associate, died in his 63d year at Brookline, Mass., June 10, 1921.

JAMES CLARENCE QUIGGLE, Associate, aged 69, died at Washington, D. C., June 21, 1921.

FREDERIC SCHENCK, Associate, died at Lenox, Mass., Feb. 29, 1920.

MRS. CECIL STEWART, Associate, died at Boston, Mass., early in the summer of 1921.

GENERAL NOTES.

The Kittiwake in Florida.—I shot a Kittiwake, (*Rissa tridactyla tridactyla*) on the beach at Jupiter on the east coast of Florida on January 24, 1921.

The feathers of the lower surface were very heavily coated with crude oil but as the bird was in fair condition the accident must have been of recent occurrence.

When first observed it was sitting among some Herring Gulls near high water mark, as it rose I saw it was not a Bonaparte's Gull, which I had taken it for, and shot it. It proved to be a male in the plumage of the second year and is now in the State Museum at Gainesville.

I was struck with the pronounced emargination of the tail—much more evident than in the adult.—ALLAN BROOKS, *Okanagen Landing, B. C.*

[1] For obituary notice see Auk, XXXVIII, p. 496.
[2] " " " see Auk, XXXVIII, pp. 496–497.
[3] " " " see Auk, XXXVIII,, p. 622.
[4] " " " see Auk, XXXVIII, pp. 316–317.

Shoveller in Bergen Co., New Jersey, in Spring.—The marshes of Overpeck Creek, near Englewood have long been an excellent place for freshwater ducks, and their rapid increase there in recent years in the spring has been a source of gratification to many field ornithologists of the New York City region. In line with this statement the spring of 1921 was better than any previous one. On April 3, American Mergansers, Mallard, Black Ducks, Green-winged Teal, Pintail, Lesser Scaup, and Ruddy Ducks were scattered over the waters of the creek or roosting on the flats left there by a low tide. We crawled up to the very edge of the creek behind some reeds, and had several minutes of observation before some Pintails scarcely 50 feet from us gave the alarm. For a few minutes the air was full of flying ducks streaming off in various directions. A last sweep of the glasses over the supposedly deserted creek revealed a small flock of Teal and, to our great surprise, an adult male Shoveller roosting in plain sight on a mud bar. The dark head, long bill, ruddy breast and white ring around the neck were all conspicuous, and when after a few minutes the bird stood up and started waddling to the water, there could be no doubt of the identity of a so conspicuously marked species, which Griscom knew well from field experience in various parts of this country and Europe. The Shoveller has been shot just once on Overpeck Creek though the exact data was not preserved by the lucky sportsman. It is reported "to have occurred formerly" by old gunners. Otherwise we are not aware of any definite record for this species in northern New Jersey.—Ludlow Griscom and E. R. P. Janvrin, M. D., *New York City.*

Mute Swans on the Hudson.—In the July, 1921, number of 'The Auk,' under "General Notes," Mr. S. C. Bishop writes of seeing "Four swans, apparently *Olor columbianus* . . . about two miles north of Staatsburgh, N. Y." At various times other observers have reported swans from the same locality and assumed them to be of this species.

As a matter of fact, Mr. Jacob Ruppert a number of years ago introduced the European Mute Swan, *Cygnus olor*, in the large cove between Staatsburgh and Rhinebeck, and during recent years the gradually increasing flock has eluded capture and wing-clipping so that individuals and groups are often seen in the Hudson River at some distance from their home. Last autumn this flock numbered 26 birds, but during the latter part of the winter only a few were present, leaving the whereabouts of the rest a matter of conjecture. This spring nearly the whole number had returned.

This flock was recorded in 'Bird Lore's' 1920 Christmas Census and was also mentioned in the 'Yearbook' of the Rhinebeck Bird Club for 1918, 1919 and 1920, which is briefly reviewed in the same number of 'The Auk' which contains Mr. Bishop's note, the review referring to "White" Swans, which we learn was a misprint for "Mute."

It is of course likely that wild swans will decoy to these Rhinebeck birds, but unless positively identified it is safer to assume that all seen in this locality are *Cygnus olor*.—Maunsell S. Crosby, *Rhinebeck, N. Y.*

Black Tern on Long Island in Spring.—On May 29, 1921, we were studying shore birds on the famous Gilgo flats on Jones Beach, opposite Amityville, Long Island. Several Common and one Least Tern had just flown by, and we were looking at a couple of Knots and some Red-backed Sandpipers among a flock of several commoner species, when an adult Black Tern was discovered sitting on the sand at the water's edge. It turned out to be very tame, allowing us to approach to a distance which was later found to be 37 paces. With so unmistakably marked a bird it seems superfluous to describe its coloration. This is the first spring record for Long Island. Crosby's recently published spring record for Rhinebeck, Dutchess Co., N. Y., which is unquestionably authentic, is the only other from the New York City region. As a spring migrant, therefore, the Black Tern seems to be in the same class as the Connecticut Warbler, but identifying it satisfactorily is, fortunately, a much simpler matter.—Ludlow Griscom and J. M. Johnson, *New York City*.

Some Tern Notes.—In 1907, while engaged in the Mississippi pearl mussel inquiry, we found, on August 1, a colony of Least Terns (*Sterna antillarum*) breeding on Bird Point, which is the northern bank of the Ohio River at its junction with the Mississippi River. There were probably fifty birds in this colony, all busy carrying food to their youngsters.

On August 12 we discovered another small colony of Least Terns and some Black Terns, (*Hydrochelidon nigra surinamensis*), both carrying food, at the junction of Duck and Tennessee Rivers, Tennessee. The Black Tern colony seems to me rather farther south than any that I am acquainted with, while the Least Tern seems north and inland for that species.—Paul Bartsch, *U. S. National Museum, Washington, D. C.*

The Pintado Petrel (Daption capense) in Maine.—In 1883 this bird was accorded a place in our fauna in these terms:

"As these sheets are passing the press we learn from Mr. Purdie of this most interesting acquisition to our fauna There appears to be no reasonable question in this case. The bird is said to have been shot at Harpswell, Casco Bay, Maine, and is now preserved in the collection of the Natural History Society of Worcester, Mass., where it is or was labelled "Mank's Shearwater." The identification of the specimen rests upon Mr. Purdie's authority. I have seen a letter[1] to Mr. Purdie from Mr. E. H. Forbush, of Worcester, containing a statement from a Mr. Wooley writing from Sabattis[2], Me., certifying to the capture of the bird at the place named some eight years ago."[3]

This record failed to receive attention in those works where it should have been mentioned, though it was cited in the third edition of Coues' 'Key to North American Birds.'

[1] This letter has disappeared.
[2] A suburb of Lewiston.
[3] 1883: New Eng. Bird Life, II: 266, 267.

When the writer began to give attention to the literature and records of Maine birds, this case where on the one hand there was said to be "no reasonable question," and on the other hand an almost absolute silence, was met with. The question arose as to whether the A. O. U. Committee on Nomenclature had information on the subject not known to the general reader, and a letter was addressed to Dr. Coues, then chairman of the Committee. This brought the reply that he and presumably others had forgotten it, that he had no doubt of the authenticity of the record. He suggested that the matter be investigated anew, and a supplementary note sent to 'The Auk.'

This investigation was promptly undertaken, and the group of letters at hand from nearly every person connected with the matter show, it is believed, that the original record quoted above is correct. But since the record has fared badly in certain works on Maine birds, and many of the persons from whom the facts have been gathered have passed from life, it seems that these facts should be given to the public, with sufficient fullness to make the matter perfectly clear.

The late Thomas A. Dickinson, from 1872 to 1880 superintendent of the Worcester Museum of Natural History, and later Custodian of the Worcester Society of Antiquity, took great pains to aid in reaching the true facts in the case, and to his knowledge thereof, and his unfailing patience and effort we are much indebted.

On December 23, 1896, Mr. Dickinson wrote that he purchased the bird in question for the Worcester collection in September 1875, as shown by the records of the Society. Miss Dell Teneyck who was custodian of the Worcester collection in 1896 wrote in May of that year that "The specimen is labelled as follows; Puffinus anglorum (Temm). Mank's Shearwater; Lewiston Me., (young) June 1873."[1]

So far we are on safe ground, amply attested by the invincible records of the Worcester Society of Natural History, and except for a discrepancy in the locality (Lewiston, which is easily explained through the fact that the bird was purchased in that place), in agreement with the 'New England Bird Life' record.

The "Rift within the lute" came in a letter from Levi Wooley to Mr. Dickinson written March 1, 1897, in which he says "I do well remember letting you have the Shearwater bird. . . It was killed by C. F. Nason, formerly of Lewiston, Me., at the time we were up to the Rangley Lakes. Bird killed on Moose-luck Meguntic Lake in the year Hell Gate was blown up." Mr. O. W. Knight receiving this through another source published the essential part of Mr. Wooley's statement in his 'Birds of Maine.'[2]

Mr. Edwin Wakefield, however, with whom Mr. Wooley and Mr. Nason visited Rangley Lakes, states that he remembered nothing about the bird and that the only trip they made was in September 1876 which happens to

[1] Miss Ella L. Horr, present Custodian supplies the information that it is a female.

[2] 1897, Knight; Bull. 3, Univ. of Me., pp. 23-24.

be the exact time of the Hell Gate explosion. It is practically certain that Mr. Wooley's memory became confused after a lapse of twenty years and that he was thinking of some other bird, especially since it was he who gave Mr. Purdie the original data for 'New England Bird Life' stating that the bird was taken at Harpswell, Casco Bay, and this when the record was only a few years old. Unfortunately the label has been replaced by another following in part the Wooley letter of 1897.—ARTHUR H. NORTON.

Cory's Shearwater off Newfoundland, with Remarks on its Identification in Life.—On August 11, 1920, while on the Labrador steamer a few miles north of Bonne Bay, western Newfoundland, and about one mile off-shore, we came across quite a gathering of water-birds, Terns, Gulls of 3 species, some Gannets, and a flock of Leach's Petrels. Suddenly a Shearwater cut across the bow and joined the Petrels, all flying along with the boat and not more than 100 yards distant. Any Shearwater would have been unexpected, but we were very much surprised to immediately recognise Cory's Shearwater, a species not recorded previously in such a northern latitude.

This bird is little known to American field ornithologists, and as the characters given in Chapman's 'Handbook', for instance, make it appear a difficult species to separate from the Greater Shearwater, a note on this subject may be welcome, as we were well acquainted with both species prior to the observation above recorded. There is no difficulty whatever in distinguishing them even at a considerable distance. In the Greater Shearwater the dark fuscous cap extends down to a line just below the eye, where it gives way abruptly to the white of the underparts, this white forming an incomplete collar on the neck. In the field the cap appears black, and the bird has, consequently, a strongly bicolored appearance on the side of the head, while the invasion of the white half-collar in the darkly colored upperparts is equally noticeable. The head and neck of Cory's Shearwater is a lighter ashy fuscous above. This color extends much further below the eye on the side of the head than does the dark cap of the Greater Shearwater, and then fades *very gradually* into the white of the throat and breast. There is no trace of a half-collar. In the field, therefore, Cory's Shearwater appears as a grey-headed bird with a white throat, without any contrast of color. Cory's Shearwater has a longer, stouter, yellow bill, the Greater Shearwater, a shorter, slenderer, blackish bill. The difference in color in the bill is not very satisfactory, but the difference in proportions is about as good between these two Shearwaters, as for instance, between the Downy and Hairy Woodpeckers, or the Glaucous and Iceland Gulls. We have not found the difference in color of the under tail coverts of any value in the field, and do not believe this character could be used except under most unusual circumstances. Cory's Shearwater is a slightly larger bird throughout, but the degree of difference is small, and we do not regard this as a reliable field character.

To return to our Newfoundland bird, the characters discussed above were all duly noted. It remains to add that the weather was extraordinarily hot, over 90°, and that a strong southwest gale had been blowing for two days.—LUDLOW GRISCOM AND E. R. P. JANVRIN, M. D., *New York City.*

The Old Squaw (Harelda hyemalis) at San Diego, Calif.—In 1896 the late Lyman Belding shot an Old Squaw in San Diego Bay, the capture being recorded in 'The Auk,' by the undersigned as being the most southerly record for the species on the Pacific coast. For 24 years this remained the only recorded capture of the species so far from its normal winter habitat. We now, however, have several records that would seem to indicate that this duck might be of more frequent occurrence than was supposed. On January 4, 1920, a female was taken on Mission Bay and on December 3, of the same year a male was shot at the same place. Again on the 2nd and 19th of November, 1921, two females were taken, four records in all for the same body of water and all by Mr. Ad. Pearson, a local sportsman-naturalist. Mission Bay, which appears on most maps as False Bay, is about a mile north of San Diego Bay and is an extensive body of shallow water offering unusual attractions for water and shore birds. Mr. Pearson has shot over these waters for the past 35 years and states that he has not seen any of these ducks prior to January 1920.—A. W. ANTHONY, *Natural History Museum, San Diego, Calif.*

King Eider (Somateria spectabilis) in Southern Michigan.—The note in the July 'Auk' of the occurrence of King Eiders near Detroit reminds me that a specimen came into my hands in November, 1911. It was a young male and was shot out of a small flock on Gun Lake, Barry County, Mich. The skin is now in the museum of the University of Michigan.—W. E. PRAEGER, *Kalamazoo, Mich.*

Shelduck (Tadorna cascarca) in Massachusetts.—Last October Deputy Fish and Game Commissioner, Carl E. Grant, of Gloucester, brought in to me a Shelduck (*Tadorna cascarca*) in the flesh, a young female killed October 5, 1921, near the mouth of Essex River, Ipswich Bay, Essex County, Mass., by a sea captain of Gloucester, Howard H. Tobey. He states that when first seen, it was alone over his decoys about half a mile from shore and was very shy. The bird was somewhat pin feathered and had not quite finished molting, although its wings consisted entirely of new feathers. There were one or two rectrices missing, perhaps three, and three more only partly grown.

The question at once arises whether this bird had escaped from captivity. I looked the plumage over very carefully and its perfect condition indicated that the bird had not been in captivity, at least since the molt.

The specimen will be presented to the Peabody Museum. A description

of it follows: Bill pinkish dusky toward tip (nail positively black) lamellated; trifle broader towards tip than at base; nostrils in the basal third. Head and about one-half neck brownish gray, somewhat mottled with white on sides and below. Under parts including linings of wings, lower wing coverts and axillars white. Upper parts generally, including upper wing coverts white. Primaries sooty; about a terminal fourth of the secondaries dark sooty brown, with a green speculum, each secondary slightly edged and tipped below with lighter. The white tail has all but two outer feathers dark tipped. Scapulars brown. A ring across the shoulders, part way round on the breast, chestnut. Feet flesh color.

Dimensions in inches: culmen (curve) 1.87; culmen (chord) 1.87; depth of bill 1; gape gape 2.12; length 22; wing 12.25; tail 4; mid-tow and claw 2.65; tarsus 2.65.—E. H. FORBUSH, *136 State House, Boston, Mass.*

White Pelican (Pelecanus erythrorhynchos) Nesting in Minnesota.—From Dr. Frank M. Chapman's most excellent work, 'Camps and Cruises of an Ornithologist,' page 371, I quote the following: "In Western Minnesota, Pelicans nested as recently as 1878." While living at Aitkin, Minnesota, on August 15, 1904, a hunter brought to me two young Pelicans which he shot on the shores of Sandy Lake, about 40 miles north of Aitkin. They were small, not more than one-fourth grown, and were undoubtedly hatched and reared near the point of capture for they could not have migrated very far, in fact, were unable to fly.

Unfortunately their plumage was so badly soiled and so carelessly handled by the sportsman that I did not preserve them, which I have regretted since for the most undisputable evidence is the specimen in hand.—ALBERT LANO, *Fayetteville, Ark.*

American Egret (Casmerodius egretta) in Maine.—In 'The Auk' (Vol. XXXVIII, p. 109, January, 1921), I recorded an additional record of the Egret for the State of Maine—two specimens, one of which was shot and later secured by Dr. William P. Coues, who has since presented it to the Boston Society of Natural History. I also quoted twelve previously published records.

On July 15, 1921, Dr. William P. Coues saw a flock of seven on the Scarborough salt marshes which border a corner of the Prout's Neck Golf Links, and three days later a flock of nine were seen in the same locality by his brother, Robert W. Coues. This flock evidently scattered over the marshes, for between that date and the first week in September, only single birds or occasional pairs, were observed. Between July 19 and September 6, I observed single birds every few days. One favorite place was within 150 yards of the highway where there was constant passing. I stalked one bird and got within 75 yards, so that the yellow bill and black legs could plainly be seen with a glass. This bird was busily feeding in a ditch at low tide, but finally saw me and moved off to another part of the marsh.

These birds were seen by many residents in that section, who brought me word from time to time of a strange pure white bird they had seen while passing the marsh. This species certainly seems to be extending its range and in increased numbers.—RUTHVEN DEANE, *Chicago, Ill.*

Two Records of the Stilt Sandpiper.—In looking over my collection I find two specimens of Stilt Sandpiper (*Micropalama himantopus*). The first of these, No. 278, I took in a slough a little north of Burlington, Iowa, September 28, 1889. It was shot while feeding in the shallow water of this, then rapidly drying, slough.

On September 16, 1917, while returning to Washington through the Shenandoah Valley, we passed a cattle pool by the roadside a little east of Berryville, Virginia, in which a number of Least and Semipalmated Sandpipers were feeding and one bird revealed his identity and recalled my 1889 experience by immersing his head below the water in his quest for food. Having a little collecting gun aboard, we added the specimen to our collection, where it is now No. 2170.

This is the only sandpiper that I have met with which systematically fishes for food by ducking below the surface of the water.—PAUL BARTSCH, *U. S. National Museum.*

The Sharp-tailed Sandpiper in Southern California.—On September 16, 1921, while collecting shore birds on the mud flats of Mission Bay, near San Diego, a flock of eight or ten sandpipers dashed past me, uttering characteristic "piper" notes but of a tone and tune new to me. A few moments later a single bird was shot, which was of a similar appearance and may or may not have been of the same species.

The specimen proved to be a young male Sharp-tailed Sandpiper (*Pisobia aurita*), in first fall plumage and the first to be recorded from the coast of North America this far south.

When first seen the wanderer from northern shores was feeding along the edges of a tide pool, in company with one or two Least Sandpipers and showed little or no fear at my approach.—A. W. ANTHONY, *Natural History Museum, San Diego, Calif.*

The Purple Sandpiper (Arquatella maritima maritima), at Ithaca, N. Y.—On November 5, 1921, the writer collected a single specimen of the Purple Sandpiper at the head of Cayuga Lake, Ithaca, New York. It is now No. 898 in the collection of the Cornell University Museum. Apparently this is the first record of the species for the Cayuga Lake Basin.—GEO. M. MCNEIL, *Cornell University, Ithaca, N. Y.*

The Mourning Dove in Newfoundland.—Mr. W. A. B. Sclater, of St. John's, Newfoundland, has kindly permitted me to record the first known occurrence in Newfoundland of the Mourning Dove (*Zenaidura*

macroura carolinensis). The facts, which, together with a photograph of the mounted male bird, have been transmitted to me in correspondence by Mr. Sclater, are as follows:

A pair of Mourning Doves, male and female, were found together among the hills near Trepassey, Newfoundland, about October 1, 1920, and were shot by William Pennel, of Trepassey. They were received in the flesh by Mr. Sclater about October 10, 1920. The female was too badly torn by shot to make a presentable specimen, but Mr. Sclater had the male bird mounted and placed in the private museum of Mr. Frank Brehems, No. 1 Circular Road, St. John's, Newfoundland. It is probable that the arrival of these birds in Newfoundland was due to the very severe storm which passed northward along the Atlantic coast of North America on September 30 and October 1, 1920.—HARRISON F. LEWIS, *92 Argyle Ave., Ottawa, Ont.*

What is Buteo rufescentior Salvin and Godman?—In the 'Biologia Centrali-Americana,' Vol. III, p. 61–64, there is a considerable discussion of the Red-tailed Hawk, and the authors recognize all the races described at that time by American ornithologists. The following paragraph is of special interest. "In Western North America there is a large form which has been variously called by writers *B. montanus* and *B. calurus*. This bird has not apparently received a specific designation and we propose calling it *Buteo rufescentior*. It is slightly larger than true *B. borealis*, with much more rufous thighs, but has the blackish throat of that species, differing from it in having a reddish patch across the lower breast and abdomen, on which the black spots are conspicuous. This form extends from Sitka and British Columbia to California, and in the Henshaw Collection there are examples from Utah, Colorado, and New Mexico. Our collection also contains specimens from Zacatecas, San Luis Potosi, Colima, Jalisco, the Valley of Mexico, Vera Cruz, Guatemala, and Nicaragua." The true *B. calurus* of Cassin is further on, said to be very large and dark in color.

This is undoubtedly a valid description, but seems to have been completely overlooked, and Dr. Stone has kindly informed me that he does not know it. So now that a new A. O. U. 'Check-List' is in course of preparation, it seems advisable to bring this name to the attention of the Committee. The writer has no personal opinion about *Buteo rufescentior*, never having seen a specimen so named. From the range given it might apply in part to *alascensis* of Grinnell over which it has priority. Or it might well be one of the many puzzling phases of *calurus*.—LUDLOW GRISCOM, *American Museum of Natural History, New York City.*

Snowy Owl (Nyctea nyctea) in Minnesota in Mid-summer.—On August 4, 1891, a young farmer caught a live female Snowy Owl in his field near the town of Madison. I kept it in captivity until August 7, when it died. Meat was offered every day during its captiviy but it refused

eat. Its body was very much emaciated and in dissecting and making up the skin into a specimen, I found a No. 4 shot in one of its legs and the radius of one wing broken but healed again; also one of its eyes was injured.

Its plumage had a very strong skunk odor, but whether this skunk or the owl was the aggressor was the mystery.

It seems strange that so large and conspicuous an object should escape observation all summer on an open and well settled prairie, for it had been seen but once by another farmer the day before and near the place of its capture. No doubt it was a winter visitant of the winter before, wounded by an ignorant and thoughtless hunter, for it could not have traveled very far in its helpless condition.—ALBERT LANO, *Fayetteville, Ark.*

Notes on the Food of the Guacharo (Steatornis caripensis).—Some material illustrating the food habits of the Guacharo, collected in a cave in Huevos Island, May 5, 1893 by Dr. F. M. Chapman[1], was turned over to the writer who has attempted to identify its components. It is not the purpose of this article to discuss the abode and mode of life of this most interesting bird which have claimed the attention of several noted explorers and writers. But the best of the previous accounts of the Oil-bird's food may well be cited for the sake of comparison and in order to point out uncertainties due to changes in nomenclature of the plants concerned.

The Guacharo is vegetarian "quite in contradistinction" as Dr. L. Stejneger remarks,[2] "to the other Caprimulgoid birds, which are exclusively insectivorous, an interesting analogy to the two groups of frugivorous and insectivorous bats." The most detailed of the earlier statements relative to the food of this species is that of N. Funck published in 1845. He says[3]:

"Their food consists of various fruits in their seasons; I found in their stomachs palm fruits as large as the egg of a pigeon[4]; the fruits of *Aiphanas praga* (of Humboldt, Syn. Plant.); of the arboreal *Psychotria* of Caripé, as well as the seeds of *Laurus* and of *Achras*. After having digested the fleshy portion of these fruits, the birds regurgitate the stones." (pp. 373–4.)

It was chiefly these fruit pits that composed the material collected by Dr. Chapman, whose brief visit to the guacharo cave unfortunately was in total darkness due to drowning of his light, but Hornaday is quoted[5] as saying that at the time of his exploration of the same cave, the "rocks were covered with guano to a depth of several inches" and that the nests of the

[1] See Bul. Am. Mus. Nat. Hist. VI, 1894, p. 60.

[2] Standard Nat. Hist. IV, 1885, pp. 386-7.

[3] Bull. Acad. Bruxelles, XI, Nos. 11-12, 1844 (1845), pp. 371-7.

[4] Authors comment on the capacious nature of the entire alimentary tract of *Steatornis*.

[5] Stand. Nat. Hist. IV, 1885, p. 386.

Diabliton's as the species is also called were "formed of a brownish, spongy mass of considerable solidity, which apparently consisted of the undigested seeds and skins of fruits ejected from the mouth and mixed with the droppings of the birds."

Samples of the recent litter and of a consolidated almost cement-like deposit no doubt the same as that alluded to by Hornaday are at hand. The most numerous seeds in the collection are those of a palm of the genus *Euterpe*,[1] a species of which the Assai palm (*E. edulis*) is an important human food in Brazil. Several other palm seeds of the genus *Bactris* (tucum palm) also are present. Next in abundance to the palm pits are those of Lauraceae, the family including our familiar sassafras and spice bush. It is difficult to identify these seeds in their thoroughly desiccated condition, but it seems certain that both the general *Nectandra* and *Ocotea* are represented. Large pits of the tallow nutmeg (*Virola sebifera*) are prominent and it is remains of their hard shells (pericarp with its invaginations which traverse the endosperm) that almost exclusively make up the conglomerate referred to above. This may indicate a customary preponderance of this fruit in the diet of the Oil-bird, but possibly also may result from superior hardness and durability of the thick and re-enforced walls of these seeds.

Of the items mentioned by Funck *Aiphanes* is a palm that occurs in the region, but *Laurus*, now restricted to Old World plants, can be taken only as indicating the family, represented in the present material by the genera *Ocotea* and *Nectandra* previously mentioned. No fruits of *Achras*, one of the Sapotaceae, were included in Dr. Chapman's collection and as for *Psychotria*, unless the name was then applied to a very different plant from that now bearing the name, it is doubtful that Funck's reference to it is correct, for the fruits are very much smaller than the others habitually consumed by the bird. In view of the characteristic obesity of the Oil-bird it is not surprising that several of the fruits which are prominent in its regimen are noted for the unusual quantities of oleaginous substances they yield.—W. L. McAtee, *U. S. Biological Survey, Washington, D. C.*

Scissor-tailed Flycatcher (Muscivora forficata) in Northampton County, Virginia.—A fine male Scissor-tailed Flycatcher was secured on April 21, 1919, at Capeville, Northampton County, Virginia. This specimen was sent in to the Biological Survey by Mr. Fred Wall and is now number 270,322 U. S. N. M. (Biological Survey collection); this appears to be the third record for Virginia. I am indebted to the courtesy of Dr. E. W. Nelson, Chief of the Survey, for permission to publish this record.—B. H. Swales, *U. S. National Museum, Washington, D. C.*

[1] I am indebted to W. E. Safford of the U. S. Bureau of Plant Industry for help in naming the seeds.

Vermilion Flycatcher (Pyrocephalus rubinus mexicanus) in Eastern Texas.—On October 16, 1921, a well plumaged male Vermilion Flycatcher was killed by me, at Barrymore's Lake some forty-five miles from Houston, in the Brazos Bottoms near Brookshire, Texas. Dr. A. K. Fisher writes me that he thinks the record is valuable as "there is only one record so far east in Texas north of the Rio Grande Valley."—ROBT. B. LAWRENCE, *411 Westmoreland Ave., Houston, Texas.*

The Evening Grosbeak at Mt. Holly, N. J.—On November 20, 1921 I saw a male Evening Grosbeak (*Hesperiphona vespertina vespertina*). These birds were here two years ago and this was the first appearance this far south since that time.—N. De W. PUMYEA, *Mt. Holly, N. J.*

The Evening Grosbeak at Haverford, Pa.—On November 26, 1921, in a field near the grounds of Haverford College at about 7.30 o'clock of a gray, rainy morning my attention was attracted by a loud bird-note something like the chirp of an English Sparrow but much louder. At times it resembled a note of the Red-headed Woodpeccker although not so nasal. I located the bird in the top of a tulip-poplar. It was engaged in tearing to pieces the dry seed clusters of the tree. As it worked it constantly gave its loud chirping note. I had no field-glasses and at first could only note that the bird had a very short tail. It finally came lower down the tree and I was able to see its thick beak. It at last alighted on the ground not ten feet away from me and I was able to identify it beyond peradventure as a female Evening Grosbeak. It did not seem especially shy and fed on the ground for some time. Although it called in the tree it made no sound when on the ground, a peculiarity which I have noted in this bird before. Although it did not seem shy it suddenly without any apparent reason flew away, a habit which I have also noted before not only with single birds but with flocks. I hurried over to the house of a nearby bird-enthusiast and roused him out. By the time we came back some fifteen minutes later the bird was gone from its tree but I located it by its call where it was sitting in a cherry tree over a hen-house surrounded by chirping English Sparrows. My friend had just time to take a good look at it when it flew away.—SAMUEL SCOVILLE, JR., *Haverford, Pa.*

Evening Grosbeak at Scranton, Pa.—An Evening Grosbeak, (*Hesperiphona vespertina vespertina*), appeared in my garden on October 21, 1921. It sat on a small plum tree where I had an excellent view of it. It was a male bird and when it flew across the street into a tall maple I saw several other birds there which might have been females of the same species although I was not close enough to identify them positively. The few specimens we have in the museum were mostly obtained nearly thirty-two years ago at West Nicholson in Wyoming County about twenty miles from here. Since that time I have not heard of any Evening Grosbeaks in this part of the State.—R. N. DAVIS, *Everhart Museum, Scranton, Pa.*

The Cliff Swallow (Petrochelidon l. lunifrons) in Indiana.—On the Ratliff homestead situated just west of Richmond, Indiana, where the writer spent a portion of his life, was found a colony of at least thirty pairs of Cliff Swallows, whose irregular nestings covered a period of more than twenty-five years. The large farm buildings constructed with over-jetting roofs, with roughly-sawed rafters and eave boards, furnished desirable nesting sites for the "Mud Daubers."

A small boggy pond located but a few rods away from the barns furnished the mud that was used in the "adobe," bottle-shaped nests.

Large farm buildings similar to those on the old homestead, were found on neighboring farms, about the eaves of which the swallows nested. These structures were not so far from the before-mentioned pond, but were adjacent to a sluggish stream of water, Clear Creek, upon whose edges the particular kind of wet soil also abounded.

It was not generally known at that time, that it was a peculiar trait of this bird to not nest consecutively, year after year, at the breeding places. It was observed, however, that at times, perhaps a couple of years out of every five, at one or other of the farms, scarcely an individual bird would be seen. This was evidently counterbalanced, by the increased numbers, at the others.

About the year 1895, fire destroyed our barn buildings. And not long after, a similar fate befell the barn on the nearest adjacent farm. In rebuilding, machine-dressed lumber was used and the poor swallows, after repeated trials, had to abandon building their adobe nests, as the mud houses would break from their adhesions to the smoother lumber and fall to the ground. This, with the drainage of the pond, followed by agricultural cultivation, really left the birds nought but to seek other quarters.

A couple of farms, two or three miles away, to the north and along the Clear Creek streams, were selected, and from then until at present, the constantly diminishing numbers have been almost annually nesting. At present, but a mere half dozen pairs are seen.—Walter S. Ratliff, *Richmond, Indiana.*

Nesting of the Louisiana Water-Thrush in Massachusetts.—On June 9, 1920, at Huntington, Massachusetts, in company with E. R. Cross I visited a nest of the Louisiana Water-Thrush. We spent at least an hour in careful examination at close range of both adults and one of the young, which I held in my hands. The nest itself was so cleverly concealed that we might have been unable to find it had not the birds, feeding their young, disclosed its location. On the perpendicular moss-covered bank of a small spring brook the bird had hollowed out a place for the nest, the bottom of which was not more than six inches above the running water. The nest was invisible from above, but by getting down on hands and knees and by peering into the hole we could see the young.

While I was trying to get a good close look at one of the young birds,

they all left the nest. They were well feathered and able to fly eight or ten feet at a time. As the young left the nest the parent birds became greatly excited, creeping about on the ground with outstretched wings and chipping to attract attention away from their offspring.

The nest was composed outwardly of dead leaves, tightly compressed, and was lined with the round stems of grasses and fine black rootlets.—ALBERT A. CROSS,

The Short-billed Marsh Wren in the Montreal District.—Mr. H. Mousley's recent record of a Short-billed Marsh Wren (*Cistothorus stellaris*) taken at Hatley[1], drew my attention to the fact that it is the only published record of the occurrence of this wren in Quebec Province, and it is quite time that the erroneous impression regarding its status here should be corrected, as at least a few observers have been aware of its occurrence in the Montreal District for several years past.

In this locality the Short-billed Marsh Wren has a decided preference for sphagnum bogs—not so much the bog proper as the firmer ground about the bog margins, where there is a certain amount of free surface water and a fairly heavy growth of grasses and sedges. Here the silky tassels of the cotton-grass, waving above the lesser growth, are a familiar sight and one is more apt to find swamp laurel in greater abundance than bushes of Labrador Tea, which appears to thrive better in the yielding sphagnum. Clumps of alders are also commonly found with an occasional tamarack sapling and sometimes beds of cat-tails, while often there is a thicket of poplars and birches in the background. The intrusion of a rail or waggon road into the bog appears to create the proper environment as it is in such places that I have found the birds most commonly, which leads one to surmise that the road-beds antedated this Wren's arrival here. It was near a railroad that I first saw the Short-bill, frequenting the undergrowth about a drainage ditch that parallels the high-banked road-bed, skirting the margin of a five-mile stretch of intermittent sphagnum bog known as the "Bad-lands," and situated near St. Janvier in Terrebonne County, about eighteen miles from Montreal.

These "Bad-lands" (from the farmers' view-point) comprise a number of more or less open sphagnum bogs interspersed with wooded areas or islands. The tree growth is mainly black spruce and tamarack with patches of poplar and white birch. Almost the entire area, lying between some forested sand-hills and the Mascouche River, and extending for several miles in a north-easterly direction, is of this character.

Since my first view of this Wren, on June 18, 1911, I have seen it on various occasions in different portions of this area and I consider it common and well distributed in loose colonies. Although it is difficult to form even an approximate idea of the number of Wrens occurring there, I believe that one hundred pairs would be a low estimate.

[1] The Auk, 1918 and 1921.

On the above-mentioned date, in company with Mr. W. J. Brown, I must twelve individuals—as nearly as it was possible to judge—actually. I saw only three of them as they have a mouse-like dread of casting shadows; in fact they are mouse-like in most particulars—even to building a mouse-like nest. All wrens are alike in one respect; when nest-building their great concern is to have an entrance through which only a wren can squeeze. As is well known wrens' nests are globular structures with side entrances. Even the House Wren, which has a tendency to depart somewhat from this habit, nesting in the hollow core of a stump, builds a roofed nest at the bottom of the cavity on which to rest the slender sticks that fill up any superfluous space in the entrance. So the House Wren, also, has a humble residence with a side-door.

One of the three birds seen was fairly conspicuous, perching for a minute or more in the top of a swelling tamarack, just within the shade of a clump of evergreens, where it violated not its sputtering portent. Its mate ♀, similarly engaged a short distance away, was seldom seen and never for more than a second or two. One could usually tell when the bird was in view by listening to its scolding as the muffled tone would grow gradually sharper, almost flinty, as the Wren slipped into view.

These alarm notes sound to me something like the syllables *sur*—*ur*—*ur*-*ir*-*ir*-*ir*-*ir*. The utterance is not always exactly as I have written it; the pauses are variable in length, though not nearly so variable as in the alarm notes of the Winter Wren, which consist almost entirely of the syllable "ahur," "ahur" in a great variety of combinations, which often vaguely recalls the alarm note of the Song Sparrow. The notes of the Short-bill have been well likened to the sound produced by sharply striking one pebble with another, though this is more nearly true of the song notes.

After watching these birds for some time we became fine they were not going to give us any clue to the nesting-site and a thorough search was commenced which at length revealed the nest, almost resting on the nose of the head of a low comma man. It was very cosily fastened to the man and was fairly well hidden by surrounding grasses. In respect of being globular and having a side entrance it resembled the nest of the Long-billed Marsh Wren. Otherwise the loose construction and composition of very old grasses and sedges recalled nests of the genus. Also it was resting practically on the ground, or moss. It contained two newly-hatched young and three undue eggs, two of which were smaller. As far as I could discover the lining consisted of down from poplar ♀ catkins, a piece of fur-covered bone and, and a few chicken feathers.

On June 16, 1920, I saw a scolding individual in another locality a few miles distant, in a wet meadow within a couple section of the above-mentioned sand-hills. The bird was frequenting a man-made drainage ditch in a low-lying part of the meadow where the grasses tended to grow in clumps. As I could find no other Wrens in the neighbourhood it is probable that this bird was merely an overflow from the main log colonies.

Visiting the north-eastern apex of this district, ten or twelve miles distant, on June 24, 1920, I counted nine individuals within a mile radius.

Coming to the present year (1921) my first note on this species was given to me by Mr. W. J. Brown who saw a large number (undetermined) on the 29th of May, in a sphagnum bog in Berthier County, about forty miles from Montreal. Mr. Brown was of the opinion that the Wrens had just arrived as a very small section of the locality was quite densely populated and they were not seen elsewhere. Here on June 17 I found the Wrens seemingly less numerous but better distributed, never noting more than two or three from any one point, although I recorded upwards of twenty individuals, and there were probably many more.

On my last visit to this district (August 21) I noted only four or five birds, apparently a family group, from which I secured a juvenile female.

There may have been others in the vicinity, in fact, judging by the scanty literature referring to this Wren's movements, it seems probable that no migratory movement had started at this date. Because one fails to see or hear this Wren is not necessarily proof of its non-presence. This is true generally of bog birds. This fact always calls to mind an occasion when a friend of mine was piloted to a bog, famous for its wealth of bird life. By a wet, miry route the bog was reached, evidently during a siesta, as 'scarce a bird was seen nor a bird-note heard' and my friend indignantly exclaimed, with much emphasis on the first word: "Now! where are your birds?"

In the district where the Short-billed Marsh Wrens occur there are at least nineteen species of summer-resident warblers, as well as many other birds, and yet, on certain days during the nesting season, I have walked for considerable distances in the open bog when there was scarcely a ripple of avian activity apparent. Sometimes a Marsh Hawk, gracefully skimming the surface of the bog, will be the only bird in view. The 'hide-and-seek' tactics of the smaller bog birds are probably due to the activities of this ardent hunter and to the forays of that arch-destroyer, the Sharp-shinned Hawk. Otherwise the bog has compensations in the matter of insect abundance and comparative lack of mammals, both human and four-footed. Also there is a dense carpet of mosses and other small growth with many canopied runaways which afford to the ground-haunting birds ample concealment and freedom of movement.

I find the Swamp Sparrow and Yellow-throat the most common nesting associates of the 'Short-bill,' while the Wilson's Warbler frequents nearby alder clumps. Another bird that one would scarcely expect to find here is the Savannah Sparrow. It is one of the common bog birds but adheres more closely to the level and seemingly meadow-like surface of the more open bog.

Such birds as the Junco, White-throated and Lincoln's Sparrow, and Yellow-Palm Warbler are usually found where there is less free water, amongst the bush-capped mounds and small spruce shrubs that gradually merge into the forest growth. Of these birds the White-throated Sparrow and Junco also occur commonly within the forest.

I have never seen the Long-billed Marsh Wren in these sphagnum bog haunts of the 'Short-bill'; in fact I know only of one inland locality in which it occurs—a wet grassy area encircling a pond and encircled by willow growth, situated near St. Hubert, about three miles from the St. Lawrence River.

The 'Long-bill,' however, is a rather uncommon summer resident in a few river marshes near Montreal. I have no doubt that further investigation will disclose the Short-billed Marsh Wren in other bogs in this portion of Quebec Province.—L. McI. Terrill, *44 Stanley Ave., St. Lambert, Que.*

The Short-billed Marsh Wren in Amherst, Massachusetts.—A pair of Short-billed Marsh Wrens (*Cistothorus stellaris*) were seen by us in a South Amherst marsh on July 16, July 27 and August 3, 1921. This bird does not seem to have been previously reported from Amherst. On both dates in July the male Wren sang and in August three birds were seen. They were in a wet meadow with a large brook at one side; the vegetation being a swamp grass. In a neighboring swamp on July 27, a Henslow's Sparrow (*Passerherbulus henslowi henslowi*) was watched at close range for some minutes while he treated us to his odd excuse for a song.—L. B. Nice and Margaret M. Nice, *Norman, Oklahoma.*

The Determination of the Type of the Genus Cistothorus Cabanis.—The third edition of the A. O. U. 'Check-List' gives monotypy as the means of arriving at *Troglodytes stellaris* Naumann as the type of the genus *Cistothorus* Cabanis (Mus. Hein th. 1, 1851 p. 77 note). It so happens, however, that the foot-note in which *Cistothorus* is erected by reference to *Troglodytes stellaris* Naumann, is continued on the succeeding page where a second species, *Cistothorus interscapularis* Nordmann (& *Thryothorus polyzonus* Vieillot, Nouv. Dict. Hist. Nat. 34, 1918, p. 59), is mentioned. This, of course, removes monotypy as the reason for assigning *T. stellaris* as the type of *Cistothorus*. The earliest designation for the type that I have been able to find is by Baird, 'Report of the Pacific Railroad Survey, Birds' 1858, p. 364, who designates *Troglodytes stellaris*.

The next edition of the 'Check-List' should, therefore, correct the present statement of type under *Cistothorus*, substituting "Type, by subsequent designation, *Troglodytes stellaris* Naumann (Baird 1858)."—J. L. Peters, *Mus. Comp. Zool., Cambridge, Mass.*

Mockingbird in Maine.—I was much interested in the article on the Mockingbird in the July 'Auk.' I can add one more record for the state of Maine. Mrs. E. Josephine Runnels of Brunswick, Maine, writes thus: "We first heard the bird singing February 8, 1921, and thought it a Catbird. The next day we saw the white markings and called it a Mockingbird although we could not believe it was one so far north and in February.

However it proved to be, and remained with us till April 8. He stayed in and about a brush-pile most of the time going away for ten or fifteen minutes and then back again. He seemed rather fond of being looked at, not at all shy. He sang a great deal, at first not so loud and frequently. Mr. Runnels put up a feeding board for him. He had been feeding on buckthorn berries driving away Robins that came to feed on them, and apples that were left on the trees. We put various foods on the board but of all we put out he liked doughnuts best. Would not touch canned fruits or nuts,—that is peanuts or walnuts. We also put out a dish of water from which he drank but we never saw him bathe. When we called him he would often come out of the brush pile evidently to see what the noise was. He disliked the Robins but the Song Sparrows he seemed to enjoy. Both would be singing on the same brush pile at the same time."

Prof. Gross of Bowdoin College identified this Mockingbird and also some who had seen Mockingbirds in the south.—CARRIE ELLA MILLER, *Lewiston, Me.*

The Hermit Thrush (Hylocichla guttata pallasi) as a Summer Resident in New Jersey.—On July 11, 1921, I visited for the first time the observation tower on Bearfort Mountain above Cedar Pond, near Newfoundland, New Jersey. The tower is situated on the rocky ridge of the mountain at an altitude of 1400 feet. While on the wood-path immediately below the summit I attracted a number of birds by "squeaking" and among them, to my surprise, was a Hermit Thrush. It suddenly appeared on a branch in front of me and gave me an excellent view, raising its rufous tail in characteristic fashion. Search of the locality the next afternoon proved fruitless, although a brief snatch of the Hermit's song was probably heard in the distance.

A second visit to the region was made later in the month, and on July 23 I had the good fortune to find a pair of Hermit Thrushes in the same spot in which the first bird had been seen. The male sang for several minutes at about sunset. On the 25th at least one of the birds was again seen and a few strains of song heard. On these last two occasions all four call-notes of the species were heard.

That this was a pair of breeding birds there can be no reasonable doubt. Their presence in the same spot during at least the greater part of the month, their evident uneasiness while I was in the vicinity, and the actions of one bird which sat for some minutes with food in its bill, all indicate that they were nesting. Although I had spent considerable time in this region in previous years, the Hermit Thrush had never before been observed in the breeding season and there can be no doubt that as a summer resident the species is rare and local.—W. DEW. MILLER, *American Museum of Natural History, New York City.*

Notes from Lyme, Connecticut.—Two female Blue-gray Gnatcatchers (*Polioptila caerulea caerulea*) were seen by Dr. L. B. Nice and myself, August 17 and 18, 1921, on Lord Hill, Lyme, Connecticut. They came to a black cherry tree only a few yards from the house where we were staying; they were tame and allowed a close approach. Both of us are very familiar with these birds as they are common in southern Ohio and Oklahoma. In Sage, Bishop and Bliss' 'Birds of Connecticut' the Blue-gray Gnatcatcher is listed as a "very rare summer visitant."

Two Red-breasted Nuthatches (*Sitta canadensis*) were seen on August 24, 1921, three days earlier than their earliest fall arrival as recorded in 'Birds of Connecticut.' Myrtle Warblers (*Dendroica coronata*) were three weeks ahead of time for their earliest arrival is reported as September 14. We saw five on August 24, 1921, two in Norway spruces on Lord Hill and three eating bayberries by the Connecticut River. The migration of these birds may have been hastened by the cool weather of August.—Margaret M. Nice, *Norman, Okla.*

Some Interesting Dates of Occurrence near New York City.—During the last year or two of observation near New York City, unusual dates of occurrence for the following birds have been noted.

Pandion haliaetus carolinensis. Osprey.—Mastic, Long Island, N. Y., November 1, 1920. Two individuals. Several birds were seen on the two preceding days. This date, therefore, probably marks the end of the southward movement of this species.

Icteria virens virens. Yellow-breasted Chat.—Mastic, Long Island, N. Y., October 31, 1920. One individual. This is a purely casual record. The species should not be present after early October.

Toxostoma rufum. Brown Thrasher.—Central Park, New York City. February 14, 1920. One seen. One bird, probably the same individual, was seen about a week later in the same locality.

Telmatodytes palustris palustris. Long-billed Marsh Wren.—Pelham Bay Park, New York City, February 26, 1921. One individual. Observation made with Mr. R. V. Bennett.

Sitta canadensis. Red-breasted Nuthatch.—Great Neck, Long Island, August 19, 1921. One individual. This date is the earliest fall record for Long Island, except for one in July some years ago that seems only casual.—Laidlaw Williams, *New York City.*

Winter Notes from Montauk Point, Long Island.—Montauk Point has long been known as an ornithological bonanza. Jutting far out into the ocean it attracts many rare stragglers, and seems a highway for migration. In winter the milder climate and dense cover attract a suprising number of land birds, while water fowl of many different kinds throng its shores. As a locality for intensive field work it would well repay the investigator, but this has never been done. Many people have made short trips there,

and the majority of the birds recorded from Long Island have been noted there, sufficient evidence of its ornithological possibilities. The winter bird life is the least known, and consequently the most interesting. The hotels are closed, the train service is wretched, the landscape is bleak, and a long walk of eight miles is required to reach the Point, the most interesting spot, by the most direct route. For water fowl the North Shore which is steep and rocky is by all odds the best section, and it is a good thirteen miles by this route to the Point. The South Shore is a broad beach and there are comparatively few birds there. The interior is very hilly with dense tangles of bayberry and briars, a huge territory which it would take a week to cover, and where the going is difficult.

The writers were in the Montauk Point region January 1 and 2, 1921, and February 20–22. The list of birds seen January 1 was published as a 'Bird Lore' Christmas census, and gives an excellent idea of the richness of the bird life, but lack of space prevented all but the briefest notes, and some of the rarities observed require further comment. February 20 and 21 were practically lost days, as a blizzard was raging, but the 22nd was a superb day, which more than atoned for the others.

1. **Cepphus grylle.** Black Guillemot.—A few minutes after leaving the station at Montauk on January 1 a Black Guillemot in the white winter plumage was seen fishing off a wharf, about 50 feet from shore. We were on a bluff about 20 feet high just aobve it, and watched it diving and feeding for 15 minutes. The red feet were plainly visible when it dove, and even the red lining of the mouth was seen when it swallowed some food. Later on another bird was seen flying by the Point. As this was the second record for Long Island, the next day was devoted to an effort to collect the first bird noted, as well as an Arkansas Kingbird seen on the beach. Unfortunately the weather had changed overnight to a southwest gale with intervals of pouring rain. The Kingbird could not be found at all, but the Guillemot was discovered a few hundred yards from where it had been the day before, but so far out in so rough a sea that collecting it was out of the question. On February 22 probably the same Guillemot was found in exactly the same place. It was feeding just off shore, but swam out of range as soon as it perceived us. A half hour's wait behind an improvised blind brought the bird just within possible gun shot range, but while the shot scattered all around, the bird was untouched and went way out to sea for good. It is unusual for observers to depreciate their own observations, but we believe the rarity of the Black Guillemot on Long Island to be more apparent than actual. The thirteen miles of north shore of Montauk Point is typical country for this bird, whose habits we know well in life, and there is no good reason other than lack of observation to account for its alleged rarity. Elsewhere on Long Island its occurence would be purely casual.

2. **Histrionicus histrionicus.** Harlequin Duck.—On February 22 after the blizzard a pair of these ducks were found in a little cove just west

of the Point, and just a little off-shore. The adult male was, of course, absolutely unmistakable. We do not see how it could be confused with any other water bird. In addition to its bizarre coloration we noticed that the tail was held cocked up in the air, a striking habit in life. The female is certainly an obscure little duck, and would require close range and a good light to identify when alone. Again we see no reason why this duck should not occur at Montauk Point occasionally. Severe winters are supposed to bring the northern water fowl southward, but last winter was remarkably mild and open.

2. **Erismatura jamaicensis**. Ruddy Duck.—Two seen on Fort Pond January 1, and another on a small pond near Great Pond on February 22. This duck is very rare in winter on Long Island, and we know of no recent records.

4. **Fulica americana**. Coot.—A single bird seen on February 22 in the same pond with the Ruddy Duck. Another very rare bird in midwinter on Long Island.

5. **Tyrannus verticalis**. Arkansas Kingbird.—We were properly astonished to see a healthy specimen of this species busy catching insects on the north beach January 1, using bits of driftwood as observation posts. Insects were abundant, and it was having no difficulty in securing a meal. It was extraordinarily tame, allowing an approach to within 50 feet, and Crosby almost hit it with a pebble. Every possible detail of plumage was noted including the color of the outer tail-feathers, thus positively eliminating Cassin's Kingbird. It flitted up the beach just ahead of us for nearly a mile, before we left it behind. As already related it could not be found the next day in the heavy rain and high wind. It seems advisable to add that Griscom was well acquainted with this species in life, and Crosby with Cassin's Kingbird. The date is, of course, remarkable, but the mild and open fall accounts for it, as well as for the Ruddy Duck, Tree Swallows, Catbird, Thrasher, and Mourning Dove seen on the same trip.—Ludlow Griscom, Maunsell S. Crosby, and E. R. P. Janvrin, M. D., *New York City*.

Notes on crossing the Mexican Gulf from Key West to Galveston.—April 4, 1921. Left Key West on the Mallory line S. S. "Concho" at 4.30 a. m.

7.30 a. m. A few Royal Terns and a Man-o-War bird or two. Flying fish in large numbers.

9. a. m. A Kingfisher came aboard.

6. p. m. Three Boobies high overhead.

6.30 p. m. A smallish *Buteo*, (it looked like (*swainsoni*), a very small Sparrow-hawk, and a small *Dendroica* (*discors?*). All came from the south and carried on due north.

April 5, 10 a. m. A young Pomarine Jaeger hovering over a big trolling Squid we have behind.

2. p. m. A young Herring Gull with a broken leg—no other birds seen all day.

April 6. Very hot day.

7.a. m. Two Herring Gulls adult and young.

8.30 a. m. A Grasshopper Sparrow came low over the waves from the south and seemed barely able to make the ship, very weak and humped up but able to pick up crumbs from the scuppers.

11. a. m. Out of the Gulf stream into the dirty water of the Mississippi.

1. p. m. A number of Herring Gulls adults and young. The Grasshopper Sparrow is sticking to the ship.

5. p. m. Arrived at Galveston, crowds of Laughing Gulls and other water-fowl.

The Grasshopper Sparrow still aboard.

Summary.—The dearth of sea birds was most noticeable. Of interest is the fact that a bird with such small powers of flight as a Grasshopper Sparrow should migrate across the Gulf, probably from the northern point of Yucatan.

Also the migration of a Sparrow-hawk out to sea; this might have been a Cuban Sparrow-hawk or else the Small Florida form; it looked too small for the typical subspecies.—ALLAN BROOKS, *Okanagan Landing, B. C.*

Additions to the Summer Avifauna of Lake County, Minn.—If Lake county, Minnesota, with its area of 2,399 square miles, be divided from north to south into four approximately equal parts, the region covered so excellently by Prof. Johnson[1] in his bird list of that county would occupy the second most northerly division. The present writer has spent a portion of two summers in what would be the northern section, immediately adjoining, but not overlapping, the territory covered by Prof. Johnson. This section extends across the entire width of the county, and is bounded on the south by the north branch of the Kawishisi river and its connected lakes, and on the north by the International boundary waters. The bulk of the list compiled in this region by the writer is practically a duplication of the one already published for the more southerly region, with a few minor exceptions. Some species reported by Prof. Johnson have not yet been found, tho they no doubt occur: Golden-eye, Wood Duck, Pigeon Hawk, Arctic three-toed Woodpecker, Whip-poor-will, Hudsonian Chickadee, Savannah Sparrow and Lincoln's Sparrow. The following species, not recorded in the published lists were found during July and August, 1920 and 1921, and are therefore offered as further additions to the summer avifauna of Lake County.

1. **Mergus serrator.** RED-BREASTED MERGANSER.—Seen quite frequently on Birch, Canadian Carp, Knife, Eddy, Newfoundland Wind

[1] Johnson, C. E., Summer Bird Records from Lake County, Minn.; Auk, vol. XXXVII, Oct. 1920. Also: Addition to the Birds of Lake County, Minnesota, Auk, vol. XXXVIII, Jan. 1921, pp. 124-126.

lakes. On Knife lake, July 30, a female and nine young were found. Less common than *M. americana*.

2. **Nettion carolinense**. Green-winged Teal.—Fall, Basswood, Birch, Seed, Portage and Knife lakes. Seen here between July 7–13, but present only on Knife lake on my return July 30–August 5. No evidence of breeding.

3. **Querquedula discors**. Blue-winged Teal.—Seen commonly in the same region as the Green-winged Teal, but much more abundant. A number of broods of young were seen about Seed and Portage lakes, as well as the west end of Knife lake.

4. **Marila americana**. Redhead.—A single individual seen on Wind lake, August 12, 1920, may well have been accidental, as the species is certainly not common in the region in the summer.

5. **Marila affinis**. Lesser Scaup.—This species of Bluebill was found to be of more or less general distribution in the larger lakes of the boundary waters. In August 1920, it was found on Wind, Moose, Newfound, Ensign and Insula lakes. Twenty-one records during July, 1921.

6. **Fulica americana**. Coot.—Birch lake, Aug. 1, one; two on Wind lake, Aug. 4. The rocky country about the larger lakes is entirely unsuited for the breeding purposes of this species.

7. **Oxyechus vociferus**. Killdeer.—Three were seen at Carp portage on August 1, and several at the north end of Fall lake August 5. Breeds in suitable localities.

8. **Haliaetus leucocephalus leucocephalus**. Bald Eagle.—A pair of these birds, in full plumage, were seen at very close range on August 1, on the north shore of Knife lake. The male was flying and carrying a fish. The country is ideal for breeding.

9. **Strix varia varia**. Barred Owl.—Seen once in Merriam bay of Basswood lake, July 9; but heard a number of times throughout the region of the boundary waters. Undoubtedly a breeding species.

10. **Dryobates pubescens medianus**. Downy Woodpecker.—One at Eddy lake July 12; several about the smaller lakes between Ogishke, Muncie and Eddy lakes. On an island off the tip of United States Point in Basswood lake a pair was found breeding in a dead cedar stub, July 9.

11. **Melanerpes erythrocephalus**. Red-headed Woodpecker.—At Knife portage, July 13, a pair was found nesting, and the young could be heard down in the nest. Seen also on the portages to and from Wind lake, north end of Newfound, Base, Jordan and Isma lakes.

12. **Chaetura pelagica**. Chimney Swift.—Found breeding in a dead pine at Carp portage July 10, and the old birds and three young were flying about when the portage was re-visited on August 1. Seen often over Fall lake, these birds undoubtedly breeding in the chimneys of Winton.

13. **Holocitta atra atra**. Cowbird.—Several seen about the Indian clearings in Grass bay of Basswood lake, August 4.

14. **Euphagus carolinus**. Rusty Blackbird.—Not seen until

August 1, on Knife lake. After this date, three small flocks were seen, all evidently migrants.

15. **Pipilo erythrophthalmus erythrophthalmus.** TOWHEE.—A single male in song at Carp portage, July 10, is the only record for the region.

16. **Passerina cyanea.** INDIGO BUNTING.—On Eddy lake, July 12, a male in full song; Little Knife portage July 14, a male and female, the female carrying food; Bass lake August 6 (1920) a full plumaged male.

17. **Dendroica aestiva aestiva.** YELLOW WARBLER.—Fall lake portage July 8, a male in song; Merriam bay, of Basswood lake, several on July 9; Carp portage, male and female.

18. **Telmatodytes palustris palustris.** LONG-BILLED MARSH WREN.—While sitting one evening on the shore of Eddy lake (July 12) a male of this species hopped up on a rush within five feet of me and burst into full song. The only specimen seen.

19. **Sitta carolinensis carolinensis.** WHITE-BREASTED NUTHATCH.—Fall lake portage, July 8, one; Carp portage, July 10, one; Knife portage, August 1, five, apparently a whole family.

20. **Hylocichla fuscescens fuscescens.** VEERY.—Seen only once, Otter-track lake, July 14, but heard many times throughout the weeks in the woods. In 1920 heard only on the Kawishiwi river. Probably breeding.

21. **Sialia sialis sialis.** BLUEBIRD.—Seen at Carp portage July 10, and again near the indian clearings, Grass bay, Basswood lake, August 4. Breeds in suitable localities.—ALVIN R. CAHN, *College Station, Texas.*

On Accipiter chionogaster venezuelensis.—The description of this new form was published in 'The Auk', July 1921, p. 358, which did not appear until October. It is therefore predated by the publication of the subspecies in my 'Synopsis of the Accipitres,' pl. 1, p. 58, published Sept. 28, 1921.— H. KIRKE SWANN, *London, England.*

RECENT LITERATURE.

Bent's 'Life Histories of North American Gulls and Terns.'[1]—This, the second of Mr. Bent's series of 'Life Histories,' is fully up to the standard of its predecessor, and surpasses it in interest from the fact that the species treated are birds with which a larger number of ornithologists have had personal experience.

[1] Smithsonian Institution | United States National Museum | Bulletin 113 | Life Histories of North American | Gulls and Terns | Order Longipennes | By | Arthur Cleveland Bent | of Taunton, Massachusetts | (Seal) | Washington | Government Printing Office | 1921. 8vo. pp. I–X + 1–340. pll. 1–93, (78–93 in color).

The plan of the work was so fully described in our review of the 'Life Histories of the Diving Birds' that it is needless to make further mention of it here except to commend the care and perseverence of the author in bringing together the illustrations and data which have been used to supplement his own wide experience with the gulls and terns. The volume, like its predecessor, will be a work of reference which must needs be constantly within reach of every ornithologist, be he writer or editor, field-naturalist or museum curator. While according the author every praise for his part in the production, we regret to be again compelled to criticize the use of paper so thin that the appearance of the text is ruined, and the frequent unfortunate arrangement of the eggs in the otherwise excellent colored plates, which by presenting them in different positions on the same plate spoils the effect and renders them less easily comparable.

We wish Mr. Bent all speed with his work, and would urge the cooperation of all ornithologists who are in a position to help him.—W. S

Chapman on New South American Birds.[1]——As a result of Dr. Chapman's recent visit to the British Museum he has been able to definitely determine as new several birds obtained by the South American expeditions of the American Museum of Natural History which had to be compared with types preserved in the former institution. He also describes some new forms obtained by the recent Anthony-Cherrie expedition to Ecuador. The proposed new forms are as follows: *Nothocercus fusciventris* (p. 1), Popayan, Colombia: *Penelope barbata* (p. 3), Taraguacocha, Prov. del Oro, Ecuador: *Siptornis wyatti aequatorialis* (p. 4), Mt. Chamborazo, Ecuador: *Odontophorus parambae canescens* (p. 4), Alamor, Prov. Loja, Ecuador: *Nyctibius longicaudatus chocoensis* (p. 5), Novita, Choco, Colombia: *Picumnus parristriatus* (p. 6), Daule, Prov. Guayas, Ecuador; *Thamnophilus zarumae* (p. 6), Zaruma, Prov. del Oro, Ecuador: *Automolus celicae* (p. 10), Celica, Prov. Loja, Ecuador: *Basileuterus fraseri ochraceiceps* (p. 11), Chone, Ecuador, and *Sporophila insulata* (p. 12), Tumaco, Colombia. There are also described from the Museum Goeldi, *Pachyglena fuscicapilla albigula* (p. 11), Sta. Julia, Brazil; from the U. S. National Museum *Leptasthenura xenothorax* (p. 8), Urubamba Valley, Peru; and from the British Museum *L. s. cajabambae* (p. 9), Cajabamba, Peru.—W. S.

Mathews' 'The Birds of Australia'.[2]—Part 4 of Volume 9 covers the genera *Corvus*, *Sphecotheres*, *Orthonyx*, *Macrorthonyx*, and *Cinclosoma*. Following Pycraft the author removes *Sphecotheres* from the Oriolidae,

[1] Descriptions of Proposed New Birds from Colombia, Ecuador, Peru and Brazil. By Frank M. Chapman. Amer. Mus. Novit., No. 18. September 22, 1921. pp. 1–12.

[2] The Birds of Australia. By Gregory M. Mathews, IX, Part 4. pp. 145–192. October 19, 1921.

but instead of placing it in the Campophagidae he places it in a new family, Sphecotheridae, next to the latter. This family name would appear to be proposed here for the first time although there is nothing in the text to indicate it, the entire text leading one to infer that he is placing the genus in the Campophagidae. For the two genera of Log-runners he proposes the family Orthonycidae but what disposition he intends to make of *Cinclosoma* is not clear. As the text stands it is included with the Log-runners but the page heading over each species reads "Family Cinclosomatidae." Possibly a section of text covering this family was accidentally omitted. It is unfortunate that such an important work should be marred by such slips as these which leave the reader at a loss to know just what the author's views may be.

Papuorthonyx (p. 177) is proposed as a new genus for *Orthonyx novaeguineae.*

The plates and text are fully up to the standard of the work.—W. S.

Van Oort's 'Birds of the Netherlands.'[1]—Part 9 of this notable work consists, like its predecessor, entirely of plates. There are ten in all, six of ducks, one of a shearwater—*Puffinus puffinus yelkonan* and three of Marsh Hawks.—*Circus cyaneus and pygargus.* The ducks are the Eider, of which there is besides the one of the nuptial plumages, another showing the eclipse dress and the molting condition leading up to it; the White-headed Ruddy Duck, the European Merganser, Red-breasted Merganser and the Smew. The importance of this work to American ornithologists is evident when we realize that almost all of the excellent plates in the present part represent American forms or those very closely related to them and we do not know where a more satisfactory series of illustrations of duck plumages can be found.. The text to these parts will follow later.—W. S.

Howell's 'Biological Survey of Alabama'.[2]—This pamphlet based upon the field work of Mr. Howell and his assistants in practically all parts of the State, contains a detailed report on the mammals and a brief preliminary consideration of the "Physiography and Life Zones" of the State, with a number of photographs and a colored faunal map.

The report on the birds is reserved for a separate publication but lists of the characteristic breeding species of the Upper and Lower Austral Zones, the only two life zones traversing Alabama, are given in the present connection.

Failure to follow the A. O. U. 'Check-List' in this and other publications of the Biological Survey seems unfortunate. Most readers will be con-

[1] Ornithologia Neerlandica. De Vogels van Neerland door Dr. E. D. Van Oort. Afl. 9. Martinus Nijhoff. The Hague. 1921.

[2] A Biological Survey of Alabama. I. Physiography and Life Zones. II. The Mammals. N. A. Fauna, No. 45. U. S. Biological Survey. October 28, 1921. pp. 1–88, pll I–XI.

fused to find *Quiscalus quiscula quiscula* which is the Purple Grackle of the 'Check-List' applied to the Florida Grackle and the Florida Red-wing called *Agelaius phoeniceus phoeniceus*. Some departures from current nomenclature have the 'Check-List' equivalents in the foot notes but by no means all of them, and even then the misleading expression "formerly known as," is used, while as a matter of fact they *are still* the current names so far as any standard exists. If everyone is going to exercise his own preference in the matter of names why should we have a check list or strive for uniformity? It is discouraging to find the Biological Survey, which has done so much to advance American Ornithology, so easily led into this mad rush to be "up to the minute" in nomenclatural technicalities without waiting to see whether the proposals are going to receive general acceptance, and thereby rendering their publications ambiguous to the general reader.

For this, however, Mr. Howell is probably not responsible. He has furnished us with an authoritative and much needed treatise on the distribution of life in a much neglected State, while his report on the mammals is so admirable that we look forward with impatience for the appearance of that on the birds.—W. S.

Holt on the Avery Bird Collection.[1]—This little brochure consists of a catalogue of the specimens contained in the collection of birds formed by the late Dr. Wm. Cushman Avery and now in the Alabama Museum of Natural History. To these data Mr. Holt has added excerpts from Dr. Avery's field notes and from publications of his which appeared in the 'American Field' and the 'Ornithologist and Oologist,' the whole forming quite a complete catalogue of the bird life of Greensboro and vicinity where his investigations were carried on. No less than 216 species are listed.

There is a biographical sketch of Dr. Avery by his sister Miss Mary E. Avery and a portrait.—W. S.

Chapin on Congo Birds.[2]—In studying his Congo collection Mr. Chapin has come upon a number of interesting things which are here placed on record in advance of his main report.

A new species of *Buphagus* is described from Zambi, Lower Congo as *B. langi* (p. 4), and the subgeneric term *Buphagoides* is proposed for *B. erythrorhynchus*. *Nectarinia congoensis* he considers to be restricted to the region above Irebu on the forested banks of the Congo where he rediscovered it. *Neolestes* he regards as a Pycnonotid confirming Gadow's view and considers *Nicator* "as near to the Pycnonotidae as to any member

[1] Annotated List of the Avery Bird Collection in the Alabama Museum of Natural History. By Ernest G. Holt. Museum Paper No. 4. Alabama Mus. Nat. Hist., 1921. pp. 1–142.

[2] Notes on a New Ox-pecker and other Little-Known Birds of the Congo. By James P. Chapin. Amer. Mus. Novit. No. 17. Sept. 16. 1920. pp. 1–16.

of the Malaconotinae." The juvenal plumage of *Sigmodus* is discussed and another locality, on the river Dungee, for the Cliff Swallow *Lecythoplastes preussi* is recorded. A number of extreme eastern records for West African birds are also listed.—W. S.

Phillips on Species Crosses in Birds.[1] The present paper is a summary of Dr. Phillips' experiments in hybridizing ducks and pheasants up to the year 1917, when the work was abandoned on account of the exigencies of the war. He states that there has been "an impression that there is seldom anything approaching a Mendelian phenomenon in species-mating among birds." "But" he says "definite types of segregation do occur, dependent upon the degree of relationship of the genetic constitution." Dr. Phillips had already suggested in 1915 that in closely related forms there is, under experimental conditions, a closer approach to orthodox Mendelism than in crosses between more widely separated species.

The Mallard × Florida Duck crosses he says "constitute the most extreme example of segregation thus far discovered in species crosses" in either ducks or pheasants. Genetically the Florida Duck represents substantially a Mallard with the male secondary sex characters not expressed, and by the breeding test is more closely related to the Mallard than either the Black Duck or the Australian Duck.—W. S.

Mailliard on the Birds and Mammals of Siskiyou County, California.[2]—The present paper is based upon field work conducted by Mr. Joseph Mailliard and two assistants in the interests of the California Academy of Sciences, in Siskiyou County, California, May 10–June 16, 1920. The main portion consists of an itinerary with notes on various species and comments on records in earlier publications.

In conclusion there is a table of all of the species of birds observed by the party with records at seven localities. The whole forms a valuable contribution to the ornithology of northern California.—W. S.

Aves in the Zoological Record.[3]—Mr. W. L. Sclater has again compiled the bird section of the 'Zoological Record' for 1919, which appeared in August 1921. The list follows the same plan as its immediate predecessors and is characterized by the painstaking care which marks the author's work. We find 837 titles listed of which no less than 39 are by Oberholser. Chubb with 13 and Witherby with 11, are the only other authors who have published more than 10 papers within the year.

[1] A Further Report on Species Crosses in Birds. By J. C. Phillips, Genetics, VI, pp. 366–383, July, 1921.

[2] Notes on the Birds and Mammals of Siskiyou County, California. By Joseph Mailliard. Proc. Calif. Acad. Sciences, XI. No. 5, pp. 73–94. July 11, 1921.

[3] Zoological Record Vol. LVI, 1919. XVII Aves, W. L. Sclater, M. A. Zool. Soc. London. Sold at their House in Regents' Park, London, N. W., 8. Price 6s. August, 1921. pp. 1–71.

We have frequently urged the importance of supporting such an invaluable publication as the 'Zoological Record' without which the nomenclature of systematic zoology would become more or less chaotic, and its progress greatly hampered. The condition that now faces us is critical. Since the suspension of the 'International Catalogue of Scientific Literature' the Zoological Society of London has been publishing the 'Record' at a constantly increasing cost which has now reached approximately £2000 annually. It has undertaken the publication of the volume for 1920 and is sending out blank forms, soliciting subscriptions for that of 1921. If the response is not liberal the publication cannot go on. The subscription price of the entire volume will be £2.10s. and of the 'Aves' section 7s 6d. The British Museum has subscribed for six copies of the 'Record' and it seems as if several of the larger museums of America could do likewise, while *every* museum and university should have one copy and every systematic ornithologist should become a subscriber to the 'Aves'. The progress of ornithology depends upon the continuation of this yearly record of what has been published.—W. S.

Grinnell's 'The Principle of Rapid Peering in Birds.'[1]—Dr. Grinnell divides birds into two groups, those which wait passively for the appearance, within reach, of moving objects of food value, and those which are more or less constantly in motion seeking items of food which are stationary. He considers that there is no such thing as "excess-of-vigor" and "'joy-of-living" as they are used to explain the lively, joyous actions of many birds, and that an adequate explanation of such activity, involving stern utility should be looked for. He finds that an object moving at a distance is easily picked up by the human eye but a stationary object, like a golf ball in the grass for instance, is looked for by constant, movement of the searcher and, within certain limits, the greater the activity, the sooner the object will be found. It is moreover the rapid movement of the eye as much as anything else that brings success. With birds the critical food period is winter and the nervous activity of birds like Kinglets at this season is really the intense effort to find enough food to satisfy their needs, in which the principle of "rapid peering" plays a most important part. Dr. Grinnell's explanation is ingenious and doubtless correct, while it is an excellent illustration of the attitude of mind necessary to study problems of animal behavior.

Incidentally he refers to such "humanistic terms" as "joy-of-living" being often used "even in our more serious ornithological literature." We question (and doubtless Dr. Grinnell will entirely agree with us) whether there is not a perfectly proper side of ornithology that without humanizing the birds to the ridiculous extremes that some popular writers have done, and without entering the field of ornithological romance,

[1] The Principle of Rapid Peering in Birds. Univ. of Calif. Chronicle, XXIII. No. 4, October, 1921 pp. 392–396.

makes use of such terms as this in giving us a word picture of the bird and its activities that could be accomplished in no other way. Indeed Dr. Grinnell's very use of such terms shows us clearly just what activities he is going to explain in terms of "stern utility."

Bereft of all such terms what would be left of the writings of Audubon and hosts of others which have their place in serious ornithological literature as much as the equally serious studies of animal behavior which latter however have sometimes but little "literary" claims.

All of this however has no bearing on the excellence of Dr. Grinnell's paper.—W. S.

Murphy on the Seacoast and Islands of Peru.[1]—The seventh instalment of Dr. Murphy's account of his recent expedition to Peru describes Asia Island and the visit to Callao. The destruction of tens of thousands of Cormorant nests by the Condors is described and the necessity on the part of the Guano industry to kill off these noble birds when pillaging the islands is admitted. A number of interesting pictures of cormorants, penguins, etc., from photographs illustrate the article.—W. S.

Kirke Swann's 'Synopsis of the Accipitres.'[2]—Part one of a Second Edition of Mr. Swann's 'Synopsis' has appeared, "revised and corrected throughout," and with all new forms described up to 1920. It follows the plan of the first edition, the present instalment covering *Vultur* to *Accipiter*.—W. S.

Sewerzow on the Zoogeography of the Palaearctic Region.[3]—This pamphlet is a reprint of a communication presented before the Russian Geographic Society in 1877, and which showed an understanding of the subject on the part of the author far in advance of his time. He divides the region into two parts Boreal and Austral, the former containing the Polar; Northern Wooded Zone (including the North-European, Ural-Siberian and East Siberian Provinces) and Intermediate Zone, (including the Middle European, Ural-Arabian and Drurian Provinces). The Austral sub-region contains the South-West Zone (Atlantic and Mediterranean Provinces) and the Desert Zone, (Lybian, North African, West Asian, Middle Asian, Thibetan and Sind Provinces). He has in addition

[1] The Seacoast and Islands of Peru, VII. By Robert Cushman Murphy. Brooklyn Museum Quarterly, October. 1921, pp. 142–155.

[2] A Synopsis of the Accipitres (Diurnal Birds of Prey). Part I (Vultur to Accipiter). By H. Kirke Swann. Second Edition, revised and corrected throughout. Sept. 28, 1921, pp. 1–63. Price 6s. Wheldon and Wesley Ltd., 38 Great Queen St., Kingsway, W. C. 2., London, England.

[3] Uber die Zoologischer (hauptsächlich ornithologischen) Gebiete der ausserhalb der Tropen gelegenen Teile unseres Kontinents. Von Nikolai Sewerzow. Übersetzt und eingeleitet von Hermann Grote. Mit einem Bildnis Sewerzows. Dultz and Co. Munchen. 1921 pp. 1–32.

an East-Asiatic or Chinese-Himalayan Region, which might, he thinks, be as well regarded as a sub-region of the Palaearctic, and which includes the Himalayan, Sifanian, North Chinese and Japanese Provinces. The characteristics of the various provinces are discussed, mainly from an ornithological standpoint and the editor, H. Grote has a short biography of Nikolai Sewerzow with a portrait.—W. S.

Bannerman on First Impressions of Tunisia and Algeria.[1]—In the introduction to this admirable little sketch Mr. Bannerman apologizes for the fact that it contains "nothing new" and "is merely the account of a journey through Tunisia and Algeria which some ornithologists have already made and doubtless many others will make in the future." Many more we might add will never have the opportunity to make the journey and they especially will welcome Mr. Bannerman's first "impressions."

Annotated lists, valuable as they may be, give one no idea of the country they treat of, or of its bird life as a whole, and the author who has exhaustively studied a region forgets his first impressions. There is therefore a very definite value to this sort of paper and we commend it to all who would like to know just what they would see as they enter Tunisia and pass on to the edge of the great Sahara.

The electric train from Tunis to Carthage follows the shore of the Lac de Tunis, where one may see from the car windows flocks of Flamingoes stalking about, and a variety of shore birds and some grebes close by, apparently not in the least disturbed by the train. The vicinity of Tunis we learn is notable for its variety of Larks, no less than twenty varieties occurring there.—W. S.

Grote on the Birds of Ukerewe Island.[2]—This interesting island, lying in the great African lake, Victoria-Nyanza, was visited during 1908–1909 by a German missionary, Peter Conrad, who formed a collection of 750 birds representing 175 species, which Mr. Hermann Grote has listed and discussed in the present paper. The novelties contained in the collection have been previously described.—W. S.

Griscom on 'The Winter Avifauna of the Camargue'.[3]—This is a pleasing account of a four days visit to this remote corner of France with an annotated list of eighty species observed, also a list of 53 species observed on a single day, December 31, almost half of which were water birds.—W. S.

[1] **First Impressions of Tunisia and Algeria. By David A. Bannerman. The Ibis. July, 1921. pp. 387–414.**

[2] **Vogel der Ukerewe-Insel des Victoria-Nyanza. von Hermann Grote. Jour. f. Ornith., July, 1921. pp. 406–457.**

[3] **Some Notes on the Winter Avifauna of the Camargue. By Ludlow Griscom. The Ibis, October, 1921. pp. 575–609.**

Bannerman on Birds from the Belgian Congo.[1]—This paper consists of notes on nineteen species of particular interest or rarity, among the 197 contained in the collection made by Dr. Cuthbert Christy in the Uelle River District, N. E. Belgian Congo. Notes on some of the specimens and a description of a new *Crateropus* have already been published by Mr. Bannerman in the Bulletin of the British Ornithologists' Club.—W. S.

Rothschild on Birds from Dutch New Guinea.[2]—The collection here described was made mainly on Mt. Kunupi, Weyland Mts., inland from Geelvink Bay. It contained among other interesting specimens 153 skins of Paradise-birds representing 22 species and subspecies. A new Honey-eater *Melirrhophetes belfordi joiceyi* (p. 285) is described—W. S.

Recent Papers on Bird Conservation.—The constant demand for literature in carrying on the work of bird conservation necessitates the continual reissue of the leading facts and arguments in new form. An admirable pamphlet covering the whole theory of bird protection is 'The Utility of Birds' by Edward H. Forbush,[3] issued by the Massachusetts Department of Agriculture, while the U. S. Biological Survey's latest publication on these lines is 'Farm Help from the Birds' by W. L. McAtee[4] in which the food of many species of birds is briefly summarized and the method of investigating the food habits is described. Another pamphlet from the same source by E. A. Goldman[5] is entitled 'Conserving our Wild Animals and Birds' and explains both the object and the difficulties in keeping up the game supply and preventing extermination of species. The existence today of over five million licensed hunters who go out for game every year is a serious factor.

Dr. John C. Phillips[6] discusses much the same questions in his 'Conservation of our Mammals and Birds' and he is forced to admit that "the outlook today to the lover of wild life and wild places, is most discouraging" though he does not share the views of some who care deeply for these

[1] On some Rare Birds from the Belgian Congo collected by Dr. Cuthbert Christy. By David A. Bannerman. Rev. Zool. Afric. (Bruxelles). VII, Fasc. 3, 1920. pp. 284–295.

[2] On Some Birds from the Weyland Mountains, Dutch New Guinea, By Lord Rothschild. Novitates Zool. XXVIII, pp. 280–294, September 1921.

[3] The Utility of Birds. Dept. Bull. No. 9. Dept. of Agric. Commonwealth of Mass. Div. of Ornithology. Edward Howe Forbush, Director. July 1921, pp. 1–83. Numerous illustrations.

[4] Farm Help from the Birds. By W. L. McAtee. Separate No. 843. Year Book U. S. Dept. Agriculture, 1920. pp. 253–270. Illustrated.

[5] Conserving our Wild Animals and Birds. By Edward A. Goldman. Separate No. 836, Year Book U. S. Dept. Agriculture, 1920. pp. 159–174. Illustrated.

[6] Conservation of Our Mammals and Birds. By John C. Phillips. Harvard Graduates' Magazine. September, 1921, pp. 36–51.

things, that the situation is utterly hopeless. He reviews the cases of the American game animals and of certain birds actually extinct or nearing extinction.

In the way of reports we have Mr. Forbush's annual report[1] of what is now known as the Division of Ornithology of the Massachusetts Department of Agriculture. In this the question of the economic status of the Downy Woodpecker and the Yellow-bellied Sapsucker is considered at length and decided favorably for the birds so far as Massachusetts is concerned. There is also a summary of bird activity in the state by months.

The annual report of the chief of the Biological Survey[2] once more emphasizes the varied and important work carried on by this Bureau and it is regrettable to know that reports on the birds of Alabama, New Mexico, and Texas have been completed but have not yet been published, we presume from lack of funds. It is most unfortunate that after carrying on valuable research work of this kind no general benefit can be derived from it. The National Association of Audubon Societies presents in 'Bird Lore,' its usual interesting and well illustrated report, which diserves the careful study of all interested in bird protection. Mr. Ahrens, who recently made a tour of the National Parks of America, has published in Berlin a report on the Conservation of Nature in the United States.[3]

The West Chester, Pa. Bird Club has issued another of its attractive reports and the usual synopsis of the 'Game Laws for 1921' and the 'Directory of Officials and Organizations connected with the protection of Birds and Game 1921' have both been issued by the Biological Survey at Washington.

The Ornithological Magazines.

Bird-Lore.[4] XXIII, No. 5. September–October, 1921.

Why Birds Interest Me. By Eugene Swope.—A beautiful analysis of the real meaning of wild bird life to the author. "It symbolizes" he says "a life of more spirit and less clay, which I seem to have lost for the most part somewhere along the way." The theme is ably continued by Dr. Chapman on the editorial page.

Three Weeks in the Boat Blind. By Guy A. Bailey.—With some excellent photographs of shore-birds, Black Terns, etc. "Sandpipers,"

[1] First Annual Report of the Division of Ornithology. By Edward Howe Forbush. Annual Report Mass. Dept. ofA gri. for year ending Nov. 30, 1920. 1921, pp. 1–47.

[2] Report of Chief of Bureau of Biological Survey (for year ending June 30, 1921).

[3] Ahrens. Mitteilungen über den Naturschutz in den Vereinigten Staaten vornehmlich seit 1915. (Beitr. zur Naturdenkmalpflege, Band IX. Heft 1 Berlin, 1921, pp. 96–109).

[4] D. Appleton & Co., Harrisburg Pa. Edited by Frank M. Chapman. $1.50 per year.

says the author, "are very active and there is no better way to become impressed with the idea than to try taking their pictures."

With the Birds in Alaska. By Mrs. G. W. Gasser.

The educational leaflet treats of the Canada Goose.

Bird-Lore. XXIII, No. 6. November–December, 1921.

A Double Tragedy. By Dr. and Mrs. F. N. Wilson.—With photographs of Quail.

What Birds Signal with their Tails. By Ernest T. Seton.

Cultivating the Birds. By C. S. Thoms.—Photographs of birds at baths and feeding shelf.

Billy a Great Horned Owl. By Dell Coleman.

Migration and Plumage Notes cover the Rusty Blackbird and Brewer's Blackbird. There seems to be a lack of uniformity in 'Bird-Lore' in the use or omission of the possessive form in such names as Brewer's Blackbird, and we had decided that authors were allowed to follow their own inclination in the matter, but when we find the editor himself using both forms on the same line (p. 299) we are forced to decide that he is endeavoring to harmonize the eastern and western schools!

The admirable annual report of the National Association of Audubon Societies occupies more than half of this bulky number.

The Condor.[1] XXIII, No. 5. September–October, 1921.

Nests of Mourning Doves with Three Young. By Margaret M. Nice.

Notes on the Rocky Mountain Jay in the Yellowstone National Park By M. P. Skinner.

A Twelve-Month with the Shorebirds. By Allen Brooks.—On the British Columbian coast, in Alberta and in Florida.

Notes from Southeastern Alaska. By George Willett.

The Northward Range of the Allen Hummingbird. By Tracy I. Storer.—Considers it of only casual occurrence north of California. There is as a matter of fact only one record beyond the limits of that state, supported by a specimen.

The Condor. XXIII, No. 6. November–December, 1921.

Home Life of the Black-tailed Gnatcatcher. By Robert S. Woods.

Notes on Fall Migrations of Fox Sparrows in California. By Joseph Mailliard.

The Mind of the Flock. By R. C. Miller.

Nesting Pine Grosbeaks in Plumas County, California, By Richard Hunt.

The Wilson Bulletin.[2] XXXIII, No. 3. September, 1921.

The Roadside Census. By Margaret M. Nice and L. B. Nice.—Interesting tabulations of numbers of species and individuals seen from an automobile.

[1] Cooper Ornithological Club, W. Lee Chambers, Eagle Rock, Los Angeles Calif. Edited by Joseph Grinnell. $2 per year.

[2] Lynds Jones, Editor, Oberlin Ohio, $1.50 per year.

An Annotated List of the Land Birds of Sac County, Iowa. Part II. By J. A. Spurrell.

Notes on the Distribution and Migration of Nebraska Birds. By M. H. Swenk and R. W. Dawson.

The Oölogist.[1] XXXVIII, No. 9. September, 1921.

Birds of North Hero Island, Vermont. By C. M. Brooks.

Some Summer Birds of the Wisconsin Woods. By C. C. Sanborn.

The Oologist. XXXVIII, No. 10. October, 1921.

Nest and Eggs of *Thryospiza mirabilis*. By H. H. Bailey.

Journal of the Museum of Comparative Oölogy.[2] II, No. 1–2, August 16, 1921.

Five articles by W. L. Dawson in defence of egg collecting and on the operations of the 'Museum' occupy about half of the number, while two others by Mr. Dawson treat of 'Beach Sand as a Drawer Lining', and 'The Season of 1917,' the later an extended account of field operations of Mr. Dawson and his associates near Tucson, Arizona, and in the Patagonia mountains, with notes on the rarer and more interesting species and a nominal list of all of the species observed. Mr. Dawson also contributes a number of short notes including a list of notable bird occurrences at Santa Barbara, covering nineteen species.

There are two other short articles, one by R. S. Sutherland on Penguins and another by J. K. Jensen on 'Nesting Boxes as a Help for a Collector of Birds' Eggs'. Many good sets of eggs of hole-nesting birds, the author explains, are lost by cutting into the tree either before the set is complete or after the eggs have been hatched. By putting up nest boxes the eggs may be under constant observation and be collected at just the right time. Decidedly a novel argument for the erection of nest boxes!

This issue is illustrated by many excellent half-tones. Incidentally we learn that two "trial issues" of Mr. Dawson's 'Birds of California,' each of 32 pages, appeared in March last, but apparently these issues have been discontinued as he states that it is still impossible to make a final announcement as to the method of publication.

The Ibis.[3] (11 Series) III. No. 4. October, 1921.

Bird Notes from Southern Spain. By J. H. Stenhouse.

Some Notes on the Winter Avifauna of the Camargue. By Ludlow Griscom. (see antea, p. 129).

A Note on Lampribis in East Central Africa. By J. P. Chapin.

An Account of the Birds met with during a two months shooting Trip in Northern Rhodesia. By S. R. Clarke.

Notes on Some Birds from the Near East, and from Tropical East Africa. By Col. R. Meinertzhagen. This paper contains critical studies of various species with discussion of their differentiation into subspecies.

[1] R. M. Barnes, Editor, Lacon, Ill., 50 cts per year.

[2] W. L. Dawson, Editor, Santa Barbara, Calif. $1.50 per year.

[3] Whelden and Wesley Ltd, 28 Essex St., Strand London. W. L. Sclater, Editor 32 shillings per year.

In connection with the Crested Larks (*Galerida*) the several races were carefully compared with the humidity and rainfall of their habitats, both as regards the entire year and the nesting season, with the result that no correlation was found to exist. There was however a direct correspondence between the tone of coloration of the bird and that of the soil upon which it lived, and the author concludes that protective coloration is responsible. Futhermore he finds that three races of Crested Larks have lived in the Giza Zoological Gardens, near Cairo, for many years subjected to identical conditions and have molted true, showing no tendency to change the coloration of their plumage, a result that coincides with Prof. Sumner's experiments with Californian White-footed Mice, but is directly opposed to those of Mr. Beebe with doves.

So many of the present day discussions on the nature of subspecies hinge upon this very question that it is imperative that we shall have a number of identical experiments carried on with the greatest care to eliminate possible disturbing factors.

We are not satisfied in systematic zoology to finally admit a subspecies without a large series of specimens and why should we discuss the fundamental nature of a subspecies and reach a conclusion with only two or three experiments from which to take our data?

Notes on the Birds of Alcudia Majorca. By Capt. P. W. Munn.

Subspecies and their Part in Evolution. By J. L. Bonhote.—A continuation of the discussion contained in previous letters to 'The Ibis' from Loomis and Lowe and Praed. Mr. Bonhote very rightly, we think, contends that the term subspecies should be restricted to geographic forms, the origin of which by the way he definitely attributes to "the climatic conditions of their habitat," which is directly opposed to Col. Meinertzhagen's conclusions presented in this same issue of 'The Ibis' and commented upon above.

He also considers that each species contains a combination of factors not present in other species while the subspecies of the same species all contain exactly the same factors, though their somatic expression has been originally altered by the environment and has become inherited.

On this basis there are certainly a number of so-called species which will have to be regarded as subspecies since they are clearly geographic forms differing from subspecies only in the fact that no intergrades now exist. We might ask how are we to ascertain just what are the factors that make up a species and how are we on this basis to relegate a given form to the category to which it belongs.

We must admit that we still fail to find any indication in the evidence to be obtained from forms in nature, of any difference except in degree between the species and the subspecies. It may be possible that certain widely separated species may have originated in some other way but most species are so obviously exaggerated examples of geographic races between which the intergrades have dropped out that it is impossible to imagine any other origin.

There is in Mr. Bonhote's valuable paper one statement that seems somewhat contradictory, though we may not have understood him correctly. On page 721 referring to statements of Lowe and Praed he says: "they imply that variations (subspecies) caused by environment cannot be inherited; and hence it would follow that a true subspecies could have had no influence on evolution and could never develop into a new species," and then proceeds to criticise their statement; and yet he himself says (on page 725) "a geographic form could never become a separate species." Perhaps his criticism referred only to the first half of their statement.

Another contribution to this subject is by Miss Maud D. Haviland in which she criticises the use of certain terms by other writers in a different sense from that usually understood, and in this connection we might be pardoned for calling attention to her use of the word "geno-type" which in ornithological literature is almost universally used to denote the type of a genus.

Among the reviews we find Mr. Mathews credited with recording a very important discovery" in the last part of his 'Birds of Australia,' i. e., that the types of Gould's species are not all in Philadelphia. We did not know that anyone had ever made such a claim, but the location of each type was thoroughly worked out some years ago by Stone and Mathews (Austral Avian Record I No. 6–7.)

Bulletin of the British Ornithologists' Club. CCLXII.[1] October 29, 1921.

Mrs. A. C. Meinertzhagen presents a description of a new Golden Plover from the Orkneys, *Pluvialis apricarius oreophilus* (p. 6) and Col Meinertzhagen a Rock Pigeon, *Columba livia butleri* (p. 6) from Gebeit, Sudan; M. J. Nichol describes *Galerida cristata halfae* (p. 7) from Wadi Halfa and *Charadrius varius allenbyi* (p. 7) from Egypt. T. Iredale separates the Palaearctic Red Phalarope as *Phalaropus fulicarius jourdaini* (p. 8) type from Spitzbergen. D. A. Bannerman describes *Anthreptes ogilvie-granti* (p. 9) from River Ja, Cameroon.

Stuart Baker describes *Dacaeum minullum subflavum* (p. 12) from Belgaum; H. C. Robinson *Cyornis rubeculoides klossi* (p. 12) south Annam, and J. D. LaTouche eleven new birds from China.

British Birds.[1] XV, No. 5. October 1, 1921.

Notes on the Great Auk. By W. H. Mullens.—Additional to those in Gurney's 'Early Annals of Ornithology' with reproductions of some early figures of the bird.

A Note on the Red-backed Shrike. By J. H. Owen.—Does not have a collected larder but hangs its prey on any convenient thorn.

British Birds. XV, No. 6. November 1, 1921.

Observations on the Breeding Habits of the Merlin. By W. Rowan.

[1] H. F. & G. Witherby, 326 High Holborn, W. C., London. P. R. Lowe, Editor.

[2] H. F. & G. Witherby, 326 High Holborn, London, W. C., H. F. Witherby Editor. 20 shillings per year.

A Short Description of the Sequence of Plumages in some Palaearctic Surface-feeding Ducks. By E. Lehn Schioler.

Avicultural Magazine.[1] XII, No. 9. September, 1921.

Nesting Notes on the Yellow-billed Cardinal (*Paroaria capitata*). By Capt. Gerald Rattigan.

The Yellow-backed Whydah. By E. Hopkinson.—Observations in Gambia.

Avicultural Magazine. XII. No. 10. October, 1921.

Zebra Finches at Liberty. By the Marquess of Tavistock.—They do well even in a small garden, never wandering far from home.

Bateleur Eagles. By F. D. Welch.—Variation in their coloration discussed.

Voices of Some Owls and Remarks on Coloration. By F. D. Welch.

Avicultural Magazine. XII, No. 11. November, 1921.

Shrikes as Cage-Birds. By Dr. E. Hopkinson.

The Emu.[2] XXI, Part 2. October, 1921.

The Naretha Parrot (*Psephotus narethae*) sp. nov. By H. L. White. Discovered by F. L. Whittock at Naretha, West Australia. With a colored plate.

A Central Australian Expedition. By Capt. S. A. White.

Further Notes on the Lyre-Bird. (*Menura superba*). By Tom Tregellas.—Photographs of its haunts, nest, dancing mound etc.

Notes on the Australian Tubinares. By E. W. Ferguson.—Petrels and Albatrosses.

The 'Times' on John Gould.—A reprint of a review of his work in this famous London newspaper. With a portrait.

Notes on Birds Observed at Ebor and the Nullarbor Plain. By A. S. Le Souef.

Further Notes from Peel Island, Moreton Bay, Queensland. By N. V. I. Agnew.

Birds of Barunah Plains and District. By James Russell.

Under 'Camera Craft' appears a photograph of a pair of nesting Emus with their young.

Revue Francaise d'Ornithologie.[3] No. 150. October, 1921. [In French.]

Three Articles on the transporting of their young by birds of prey.

Birds of the Mamara Forest and the Environs of Rabat. By F. R. C. Jourdain.

Revue Francaise d'Ornithologie. No. 151. November, 1921. [In French.]

Meeting of the French Ornithological Society.

[1] S. Austin & Sons, 5 Fore St., Hartford, England. 25 shillings per year.

[2] H. F. & G. Witherby,326 High Holborn, London, W. C. J. A. Leach, Editor. 21 shillings per year.

[3] A. Menegaux, Editor, 55 Rue de Buffon, Paris. 5 francs per year.

El Hornero.[1] II, No.3. August, 1921. [In Spanish.]

Petrels and Albatrosses of the South Atlantic. By Roberto Dabbene.—An extended discussion of the Tubinares of the region and their distribution.

Remarks on the Neotropical Species of the Genus Anthus. By C. E. Hellmayr.—Recognizes *A. furcatus* with two subspecies; *A. lutescens* with three; *A. correndera* with five; *A. nattereri* with one, *A. hellmayri* with three and *A. bogotensis* with two. Of these *A. correndera catamarcae* (p. 186) Catamarca; *A. hellmayri brasiliensis* (p. 190) Plains of Itatiaya, Brazil and *A. h. dabbenei* (p. 191), Rio Traful, Argentina, are described as new.

List of the Birds of the Falkland Islands. By R. H. Wace.

Some Notes on the Birds of Paraguay. By C. Fiebrig.

A Study of Birds in Relation to Agriculture. By F. Lahille.

L'Oiseau.[2] II, No. 9. September, 1921. [In French.]

Breeding of Lorius lory. By Mrs. M. Burgess.—Received the prize of the Societe Nationale d'Acclimatation for rearing this parrot in captivity for the first time.

The Egrets of Venezuela. By E. Tejera.

L'Oiseau. II, No. 10. October, 1921. [In French.]

Breeding of *Sturnia sinensis*. By A. Decoux.

Le Gerfaut.[3] II, No. 2. 1921. [In French.]

Death of Alphonse Dubois.

Ornithological Observations (in Belgium) May 1, 1920–April 30, 1921. Compiled by G. van Havre.

The value of Birds.

Tori.[4] III, No. II. April, 1921. [In Japanese.]

Obituary and portrait of the late Dr. Isao Ijima.

Breeding of the Green Peafowl, *Pavo muticus*.—With photographs of the young.

The Molting of Some Charadrine Birds. By N. Kuroda.

Notes on Two Stragglers, *Panurus biarmicus russicus* and *Turdus atrigularis*. By S. Uchida.

Notes on the Habits of Richardson's Skua. By T. Moruyama.

Birds Seen in Hiroshima City. By H. Nakao.

A List of Ornithological Papers which have appeared in the Zoological Magazine. By N. Kuroda.

[1] R. Dabbene, Editor, Mus. Nac. de Hist. Nat., Buenos Aires, Argentina. $6 per year.

[2] Societe d'Acclimatation, 198 Boulevard St. Germain, Paris. 25 francs per year.

[3] M. de Contreras, Editor, 52 Place Georges Brugmann, Bruxelles, Belgium. 10 francs per year.

[4] Science College, Tokyo Imperial University, Tokyo Japan.

Yearbook of the Netherlands Ornithological Society.[1] II, No. 1. 1921. [In Dutch].

A Study of the Avifauna of Gajo-land (Sumatra). By F. C. van Heurn and Baron Snouckaert van Schauburg.

The Birds of Homer. By J. S.

On our Knowledge of a Sumatran Woodpecker. Chrysocolaptes lucidus chersonensis. By E. Stresemann.

The Black-necked Grebe. By van Dedem.

On Quaternery Nomenclature, and its Use in Ornithology. By A. Laubmann.—This is an attempt to place an additional burden upon our already overtaxed system of nomenclature. As we have already pointed out elsewhere many of our nomenclatural troubles have been due to the fact that we try to do too many things with our names. The quadrinomial undoubtedly indicates more accurately the genetic relationships of the bird indicated but it becomes useless as a name because it is too cumbersome.

Yearbook of the Netherlands Ornithological Club. II, No. 2. [In Dutch.]

Proceedings of the Club Meeting of March 30, 1921.

Trip to Belgium. By Baron Snoukaert van Schauburg.—Account of the museums, etc.

A Visit to Savoy. By G. J. Van Oordt.

On the Occurrence of *Serinus canarius germanicus* in the Netherlands. By P. A. Heus.

Yearbook of the Netherlands Ornithological Club, "Festnummer" published on the tenth anniversary September, 1921. [In Dutch.]

The 1920–1921 Expedition to New Guinea.

On the Birds of the Mamberamo Country North and Central Dutch New Guinea.

Danske-Fugle.[2] II, No. 1. 1921. [In Danish.]

1920 Migration and Bird-banding for Denmark.

Ornithologische Beobachter.[3] XVIII, No. 9. June, 1921. [In German.]

Review of the Work of the Swiss Station for Bird-banding in Bern for 1920. By A. Hess.

Ornithologische Beobachter. XVIX, No. 11, August, 1921. [In German.]

Avifauna of Forest Canton Lakes and Gothard. By J. Gengler.

Ornithologische Beobachter. XVIX. No. 1. October, 1921. [In German.]

Ornithology of Lappland. By A. Hess.

[1] Club van Ned. Vogelk., Doorn, Holland.

[2] P. Skovgaard, Mogensgade, 32, Viborg, Denmark.

[3] R. G. Zbinden & Co., Basel, Switzerland. 10 francs per year.

Proceedings of the Bavarian Ornithological Society. XV, No. 1. April, 1921. [In German.[

Netta rufina as a breeding bird in the Bodensee. By R. Lauterbon.

On the Influence of Meteorological Factors on Bird Song. By A. Schwan.

On the Song of the Yellowhammer. By B. Hoffman.

Ornithologische Monatsberichte. Vol. 29, No. 9–10. September–October, 1921. [In German.]

H. Grote describes *Eremomela pusilla tessmanni* (p. 84), and *Pentholaea albifrons reichenowi* (p. 93).

Ornithologische Monatsberichte. Vol. 29, No. 11–12. November–December, 1921. [In German.]

H. Grote describes *Erythropygia quadrivirgata rovumae* (p. 109) from Mbarangandu River, Africa.

Ornithological Articles in Other Journals.

Fisher, G. Clyde. Reminiscences of John Burroughs. (Natural History, XXI, No. 2, March–April, 1921.)

Overton, Frank. Photographing Great Horned Owls. (Ibid.)—A series of remarkable illustrations some of which represent the bird in flight.

Beck, Rollo H. Visiting the Nests of Seabirds by Automobile. (Ibid No. 4, July–August, 1921.)—Experiences on Christmas Island.

Baxter, Evelyn V. and Rintoul, L. J. Report on Scottish Ornithology in 1920, including Migration. (The Scottish Naturalist, No. 115–116, July–August, 1921, and No. 117–118, September–October, 1921.)

Gross, Alfred O. The Audubon Societies of Brunswick. (The Maine Naturalist, I. No. 2, October, 1921.)

Miller, Carrie E. Birds of Lewiston-Auburn, Maine. (Ibid.)—A short popular article. Bird Notes which follow contain two Maine records of the Mockingbird.

Lloyd, Hoyes. Bird Notes by the Way in the Maritime Provinces (of Canada). (The Canadian Field-Naturalist, January, 1921.)

Rowan, William. Some Notes on the Belted Kingfisher. (Ibid. February, 1921.)—A careful study of a nest and young.

Taverner, P. A. The Evening Grosbeak in Canada. (Ibid, March, 1921.)—An historic resume with a detailed account of specimens of a breeding female and fledgling, taken by Wm. Rowan in Manitoba. The former curiously enough seems referable to the British Columbian form rather than to the eastern bird.

Soper, J. Dewey. Gleanings from the Canadian West. Part 1. Avian Fauna of Islay, Alberta. (Ibid.)—An annotated list of fifty-one species.

[1] Dultz & Co., Landwehrstr 6, Munich, Germany. 25 Mk. per year.

Terrell, L. McI. Observations on the White-winged Crossbill. (Ibid.)

Taverner, P. A. Swarth on the Fox Sparrow. (Ibid. April, 1921.) —In this careful review the writer, whose opposition to the general use of trinomial designations is well known, makes a good point for his view when he calls attention to the fact that Mr. Swarth, like any other careful monogapher, must needs look up every record for himself and will not take the determination of *anyone* else. "Of what use" says he, "have been the numerous trinomials applied to Fox Sparrows in the many local and other published lists? As far as Mr. Swarth was concerned they were no more than specific binomials."

Mr. Taverner also points out the fact, that the three "groups" into which Fox Sparrows are divisible are really of greater importance than the sixteen subspecies but are not indicated at all in the nomenclature. He suggests that inasmuch as intergradation between them seems not to have been proven they be treated as species. Some of the German ornithologists are advocating the use of quadrinomials to cover just such cases. And yet we are informed that species and subspecies are different in character.

Williams, M. Y. Notes on the Fauna of Lower Pagwachuan, Lower Kenogami and Lower Albany Rivers of Ontario. (Ibid. May, 1921.) —A list of the birds observed during the summer of 1920.

Lloyd, Hoyes. An Aquatic Habit of the Pigeons. (Ibid.)—Records several instances of Pigeons alighting on the water to drink and calls attention to the aquatic habits of most of the birds now considered most closely related to the Pigeons, as significant in this connection.

Crandall, Lee S. The Blue Bird of Paradise (*Paradisornis rudolfi*). (N. Y. Zoological Society Bulletin, September, 1921). Account of the species and reproduction of water-color drawings of the male in display in the New York Zoological Park.

Miller, W. DeW. and Griscom, L. Description of Proposed New Birds from Central America, with Notes on Other Little-known Forms. (American Museum Novitates, No. 25, December 9, 1921.)—*Ortalis cinereiceps saturatus* (p. 1) Matagalpa, Nicaragua; *Creciscus ruberrimus* (p. 2) Jinotega, Nicaragua; *Gallinula chloropus centrals* (p. 3) Metapa, Nicaragua; *Asturina plagiata micrus* (p. 4) Chinandega, Nicaragua; *Ictinia plumbea vagans* (p. 5) PenaPlan, Nicaragua; *Aramides plumbeicollis pacificus* (p. 11) Tipitapa, Nicaragua.

The authors seem to prove that *Crax panamensis* Grant is a synonym of *C. globicera* and that *Gampsonyx swainsoni leonae* Chubb is not separable from *G. s. meridensis* Swann. They also consider the Wood Rails allied to *Aramides cajanea* and come to somewhat different conclusions from those reached by Mr. Bangs.

Oberholser, H. C. Mutanda Ornithologica XI. (Proc. Biol. Soc. Wash. XXXIV, pp. 105–108, June 30, 1921.). Dr. Oberholser finds an earlier designation of type for the genus *Turdus* which transfers it to the

group now known as *Planesticus* (*Merula*). This is unfortunate enough in itself but it necessitates the changing of the specific names of six species of thrushes which were valid under *Planesticus* but in combination with *Turdus* are preoccupied by earlier identical combinations. *Merula albifrons* Ramsay is renamed *Turdus proleucus* (p. 106); *M. tristis* Sw. is renamed *T. assimilis lygrus* (p. 106); *M. grayi lurida* (Bonap.) becomes *T. incompta* Bangs; *M. bicolor* Layard becomes *T. ruficeps* Ramsay; *M. flavirostris* Sw. becomes *T. rufopalliatus* and *M. cinerascens* Rchw, is renamed *T. tephrinus* (p. 107).

Bangs, O. and Penard, T. E. Descriptions of Six New Subspecies of American Birds. (Ibid. pp. 89–92, June 30, 1921).—*Geranospiza caerulescens livens* (p. 89) Sonora, Mexico; *Otus choliba luctisonus* (p. 89) Escasu, Costa Rica; *Mecocerculus leucophrys roraimae* (p. 90) Roraima, British Guiana; *Nuttallornis borealis majorinus* (p. 90) Los Angeles Co., Calif.; *Melanotis caerulescens effuticius* (p. 91) Chihuahua, Mexico; *Tangara viridissima toddi* (p. 92) Santa Marta, Colombia.

Bensley, B. A. An Egg of *Struthiolithus chersonensis* Brandt (Univ. of Toronto Studies No. 19, pp. 3–7, 1921).—Presented to the museum of the University from Honan, China. Six eggs are known, the others being from southern Russia and Manchuria.

Wilson, Etta S. Whistling Swans (*Olor columbianus*) (Proc. Indiana Acad. of Sciences for 1920, pp. 83–85).—Many seen at Detroit, 200 and 300 at once on certain occasions passing overhead. A Trumpeter Swan identified by his call was seen about 1904.

Oberholser, H. C. The Anatine Genus Nyroca and its Nearest Allies (Ibid, pp. 105–106).—Six genera are recognized, *Aristonetta* for the Canvasback; *Perissonetta* (p. 110) a new genus proposed for the Ringneck, *Aithyia; Fulix* for the Scaup; *Nyroca* for the Redhead and *Fuligula*.

Some interesting nomenclatural conclusions are reached. *Aythya* Boie Dr. Oberholser considers is invalidated by *Aethya* Dum. but he accpets *Aithyia* Gloger which he says by virtue of an additional syllable is a different word and tenable under the present rules of nomenclature. We are not quite clear just which code or rule is referred to.

Butler, A. W. Some Rare Indiana Birds. (Ibid, pp. 135–139.)—A number of records.

Evermann, B. W. Notes on the Birds of Carroll, Monroe and Vigo Counties, Indiana. (Ibid, pp. 315–401 published 1921.)

Fisher, M. L. Birds Singing at Night (Ibid, for 1919, pp. 239–240. Publ. in 1921.)—Chat, Yellow-billed Cuckoo and Whip-poor-will. Other species mentioned were apparently the first instance of morning song.

Oberholser, H. C. A Synopsis of the Subspecies of *Electron platyrhynchum* (Leadbeater). (Ibid, pp. 341–344)—*E. p. orienticola* (p. 342) is described as new from Hyutaniha, Brazil.

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Nest and Eggs of *Thryospiza mirabilis*. By H. H. Bailey.

Journal of the Museum of Comparative Oölogy.[2] II, No. 1-2, August 16, 1921.

Five articles by W. L. Dawson in defence of egg collecting and on the operations of the 'Museum' occupy about half of the number, while two others by Mr. Dawson treat of 'Beach Sand as a Drawer Lining', and 'The Season of 1917,' the later an extended account of field operations of Mr. Dawson and his associates near Tucson, Arizona, and in the Patagonia mountains, with notes on the rarer and more interesting species and a nominal list of all of the species observed. Mr. Dawson also contributes a number of short notes including a list of notable bird occurrences at Santa Barbara, covering nineteen species.

There are two other short articles, one by R. S. Sutherland on Penguins and another by J. K. Jensen on 'Nesting Boxes as a Help for a Collector of Birds' Eggs'. Many good sets of eggs of hole-nesting birds, the author explains, are lost by cutting into the tree either before the set is complete or after the eggs have been hatched. By putting up nest boxes the eggs may be under constant observation and be collected at just the right time. Decidedly a novel argument for the erection of nest boxes!

This issue is illustrated by many excellent half-tones. Incidentally we learn that two "trial issues" of Mr. Dawson's 'Birds of California,' each of 32 pages, appeared in March last, but apparently these issues have been discontinued as he states that it is still impossible to make a final announcement as to the method of publication.

The Ibis.[3] (11 Series) III, No. 4. October, 1921.

Bird Notes from Southern Spain. By J. H. Stenhouse.

Some Notes on the Winter Avifauna of the Camargue. By Ludlow Griscom.(see antea, p. 129).

A Note on Lampribis in East Central Africa. By J. P. Chapin.

An Account of the Birds met with during a two months shooting Trip in Northern Rhodesia. By S. R. Clarke.

Notes on Some Birds from the Near East, and from Tropical East Africa. By Col. R. Meinertzhagen. This paper contains critical studies of various species with discussion of their differentiation into subspecies.

[1] R. M. Barnes, Editor, Lacon, Ill., 50 cts per year.

[2] W. L. Dawson, Editor, Santa Barbara, Calif. $1.50 per year.

[3] Wheldon and Wesley Ltd, 28 Essex St., Strand London. W. L. Sclater, Editor 52 shillings per year.

elected, George H. Stuart, 3rd, Vice-President, Julian K. Potter, Secretary, and Samuel C. Palmer, Treasurer.

The retiring president, J. Fletcher Street, addressed the meeting with comments on his local field trips of the year illustrated by lantern slides.

THE EIGHTH ANNUAL meeting of The Wilson Ornithological Club was held at Chicago on December 26 and 27, 1921. The program sessions were convened in the Field Museum of Natural History and a banquet was held on the evening of the first day at the Ft. Dearborn Hotel. A most interesting program had been arranged and the attendance was above the average. At the business session it was decided to increase the dues of members fifty cents to provide for enlarging the 'Wilson Bulletin' to 64 pages per number. Plans were laid for making the coming year, the 34th year of the Club's existence, the most active in its history and to substantially increase the present membership of six hundred.

ON JANUARY 16, 1922, there was organized at Boston, Mass., The New England Bird Banding Association. Edward H. Forbush was elected President; Chas. W. Townsend, M. D., and James MacKaye, Vice-Presidents; Laurence B. Fletcher, Secretary and Treasurer, and Mrs. Alice B. Harrington, Recording Secretary. The temporary quarters of the association are Room 940, 50 Congress St., Boston.

The district covered embraces all of New England, Quebec and the Maritime Provinces of Canada, and about 300 members have been secured.



Charles P Coin

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IN MEMORIAM: CHARLES BARNEY CORY.

BORN JANUARY 31, 1857—DIED JULY 31, 1921.

BY WILFRED H. OSGOOD.

Plate IV.

YEAR by year the number of surviving founders of the American Ornithologists' Union is being reduced until one feels the pressure of coming time when it will be a distinction even to have known them. To those of another generation, their gradual passing has a peculiar sadness and a grim significance, which bring a realization that not only they themselves but the pioneer days in which they moved are gone forever. Their names and their works stand monumentally and their personal memories will linger long, but no one can ever replace them because they and their times are inextricably linked together.

In the death of Charles B. Cory during the past year, we have lost another pioneer and one who will be remembered not only as a productive ornithologist, but also as a man of great individuality and almost picturesque character. Mr. Cory was born in Boston January 31, 1857. His birthplace was a house built by his father at 1225 Washington St., facing the Catholic Cathedral on the site later occupied by the Arlington Hotel. On his father's side, he came of sturdy old New England sea-faring stock—son of Barney Cory, grandson of Nathaniel B. Cory and great-grandson of Philip Cory, whose grandfather came to America in the first

half of the seventeenth century and settled in Rhode Island. His grandmother, on his father's side, was Meribah Gardiner who was directly descended from George Soule, reputed to have reached Massachusetts in 1620. One of Mr. Cory's possessions at the time of his death was an old-fashioned mirror which belonged to Soule and had been passed down directly. His mother was Eliza Ann Bell (Glynn) Cory of Newport, Rhode Island.

His father, Barney Cory, beginning as an apprentice at the age of fourteen in the firm of J. D. & M. Williams of Boston, soon became a partner in a large importing business, dealing principally in fine wines, silks, and luxuries, and amassed what for the times was a very large fortune. Young Cory, therefore, came into the world with the proverbial silver spoon in his mouth. He had no brothers and but one sister who reached maturity so his early life was doubtless that of a favored child where to wish was to have. At the age of eight or nine he was sent to a private school on Park St., Boston, called Park Latin School. Later he went to William Eayr's School on Tremont St., and it was there that he was prepared for college. In 1870, his father built a very large house at 8 Arlington St., Boston, and the family removed there. This was Cory's home until 1892, when he sold it ten years after he had come into full possession of it through the death of his parents. At the present time, this house still stands and all, or part of it, is occupied by offices of the 'Atlantic Monthly.'

The boy Cory showed a decided interest in outdoor sports and in animal life. When only eleven, it is related that he saved money and secretly bought a pistol with which he and another youngster attempted to shoot some birds. His father encouraged his desires and had him expertly instructed in shooting, boxing, fencing, riding, and general athletics. At the age of sixteen, he made what might be called his first expedition, a hunting and fishing trip to the Maine woods with a young friend named Bicknell. This evidently fixed his interest in natural history, for within a year he had actively begun the formation of a collection of bird skins. This was in 1874, the year following the formal organization of the Nuttall Ornithological Club, which Cory joined in February 1876, and in which he made the acquaintance of William

Brewster, Henry Henshaw, and Ruthven Deane, all of whom were senior to him by six or seven years.

In 1875, although only eighteen years of age, he took his mother on a foreign tour on which they saw the usual sights in England, France, and Italy. In Florence, Italy, plans were made for a trip to Egypt, and just before starting, while pitching pennies to beggars in the Arno, Cory made the acquaintance of another young American, Martin Ryerson by name. Later, finding themselves on the same steamer bound for Alexandria, the two formed a lasting friendship. Together they organized an expedition by dahabeeya down the Nile, where they did considerable shooting and Cory made important additions to his collection of birds. His mother accompanied them on this trip, which was fraught with adventure, Egypt being in an unsettled state at the time. About a year later, on August 30, 1876, Cory and Ryerson went to Harvard together and were roommates there, occupying suite 32 in Beck Hall. Mr. Ryerson afterwards became one of America's most useful and influential citizens. He is now President of the Board of Trustees of the University of Chicago, First Vice-President of the Trustees of the Field Museum of Natural History, and a trustee of the Carnegie Institution of Washington, while he holds many other positions of responsibility and trust.

Cory entered the Lawrence Scientific School of Harvard, and while there had the advantage of working at the Museum of Comparative Zoology, where Dr. J. A. Allen was then Curator of Mammals and Birds. His college work was somewhat interrupted by periods of travel and short absences and it is evident that here as elsewhere he followed his bent without regard to rules and regulations. Although he did not continue at Harvard until graduation, his studies there, pursued along the lines which most interested him, covered a considerable proportion of the requirements. The fall of 1878 found him entered at the Boston Law School, but his studies here were pursued only a few months. At this time he was interested in many things besides ornithology, notably athletics and other sports, but his bird-collecting was never forgotten and was pursued in conjunction with many other activities. As amply evidenced later, it was always his paramount interest.

In November 1877, during his college days, a slight indisposition, probably plus a desire for an outing with the birds, caused him to run down to Florida, where he knocked about with a friend until January 1878. During this time he wrote a small book called 'Southern Rambles,' a sort of diary of the trip written in nonsense style. It was published by A. Williams & Company of Boston in 1881, and, although other titles appeared meanwhile, was really his first literary effort. With this trip to Florida in 1877 when twenty years of age, Cory began a life of freedom and pleasure in the pursuit of natural history and sport which has scarcely been equalled and which might well be the envy of many a man. For nearly thirty years he made trip after trip, collecting birds, hunting and fishing, and pursuing various hobbies and sports. With ample allowances from his father, he spent money freely and doubtless foresaw no future in which money ever would be a problem. His expeditions as a rule were not very lengthy and were alternated with periods at the home in Boston.

In 1878, he spent the months of July and August on the Magdalen Islands in the Gulf of St. Lawrence, and the following autumn, while playing at the study of law, wrote the book 'A Naturalist in the Magdalen Islands.' In December of the same year he started for the Bahama Islands, taking with him, as became his custom on later trips, a friend, who sometimes acted as secretary, and also a taxidermist, in this case Arthur Smith, who accompanied him on several other occasions. They remained until July 1879, and six months later the well known book 'Birds of the Bahamas' was written and published.

In 1880, he again went to Europe, this time mainly to visit ornithologists and to purchase books and specimens. In England he met Sclater, Seebohm, Salvin, Godman, Porter and others. In France, Boucard and Sallè were among those with whom he fraternized. Returning to the United States, he began immediately to plan to follow up his work in the Bahamas with more in the West Indies, and on February 4, 1881, he sailed for Haiti, remaining there only a short time as a guest of the then president, but making important collections and laying foundations for the later work which made his collection of West Indian birds the best in existence and himself the leading authority in that field.

On August 18, 1882, his father died, and later his mother and his sister Jennie Louise (Cory) Tyler having also passed away, the entire estate came into his hands, making him, if not quite, then very nearly a millionaire, in a day when millionaires were far less numerous than they are now. Aside from the bereavement and the added responsibility, however, this made little difference to him, for his father had always liberally supplied him with money. His friends were naturally among men of large means and he moved in a circle which included some of the wealthiest men in America at that time.

He was married May 31, 1883, to Harriet W. Peterson, daughter of the Hon. Josiah Peterson of Duxbury, Mass., and a woman of of fine character and much charm. Thereafter his wife accompanied him on many of his shooting and collecting trips and entered with spirit into the life he loved. In later years her loyalty and devotion were a source of strength to him in many trying times. Two children were born to them, a daughter, Marion, who died in childhood, and a son, Charles B. Cory, Jr., now 30 years of age and successfully engaged in advertising work in Chicago. Shortly after his marriage he built his summer place on a thousand acre estate near Hyannis, Mass., on Nantucket Sound, where he had a large game park in which he kept elk, deer, antelopes, pheasants and other animals. Here he protected non-game birds and made what was one of the first (if, not the very first,) bird sanctuaries in America.

When the American Ornithologists' Union was organized in 1883, Cory was one of the noted company who attended the original meeting in New York and earned the title of founder. He almost immediately became a life member. In 1886 and 1887 he was Treasurer of the Union; in 1888 and again in 1896, he was a Councillor; in 1898 he was made Vice President and continued in that office until November 1903, when he became President of the Union, serving until November 1905. He had been a frequent contributor to the 'Bulletin of the Nuttall Club' and although much of his work appeared in book form, he wrote numerous short papers, descriptions of new species, and notes for 'The Auk.'

In the fall of 1884, he went to Dakota and Montana shooting ducks and geese with his friends Martin Ryerson and Charles R.

Crane, and the following winter he rediscovered Florida, fell thoroughly in love with it and adopted it as his own. For the next twenty years without a break he spent all or part of every winter in this state. As a field for collecting birds, for shooting and fishing, for the sports and social activities of which he was fond, and as a point of departure for Cuba and other islands of the West Indies, it seemed made to his order. Florida suited him exactly and likewise he suited Florida. He traveled through it from end to end, he camped in the Everglades, he boated on the lakes and streams, he yachted on the coasts, and he luxuriated at the resorts. He was known to everyone who went to Palm Beach and throughout the state his name was almost as familiar as that of Henry M. Flagler. One of his hobbies was a small museum called The Florida Museum of Natural History, which he established at Palm Beach and in which he brought together a good representation of the fauna of the state, including a large variety of birds and most of the important mammals, reptiles, and fishes. He employed a taxidermist and caretaker and the place became one of the attractions of the resort. About 1903 it was destroyed by fire and only a few of the specimens, some of which constituted valuable records, were saved. This misfortune was always a matter of very great regret to him and in after years he would frequently mention particular species of which he had been especially proud—rarities or specimens procured by his own hand after great difficulty. In Florida he often invited friends from the north for short excursions or shooting trips. Among those so entertained were Martin Ryerson, William Brewster, Charles R. Crane, Joseph Jefferson and Admiral George Dewey. In January 1888, he encountered in his precincts a young man named Frank Chapman whom he found receptive and apt regarding many things, ornithological and otherwise, in which he was interested. An enduring friendship, therefore, was begun with another ornithologist.

Although never missing his annual visit to Florida and usually spending at least a part of his summers at Hyannis and Great Island in Massachusetts, he was on the move much of the time. In 1886, he made a short trip to Cuba, where he met the Cuban naturalist, Dr. Gundlach. In 1887, he went to Mexico and the

southwestern United States and later in the same year to eastern Canada. In 1888, big game shooting in Alberta occupied him for a few weeks. In July 1889, he again went to Europe and attended an International Congress of Zoology, meeting the French ornithologists Oustalet and Milne-Edwards and in England Alfred Newton and Bowdler Sharpe, spending considerable time with the latter. In 1891, he cruised about the West Indies, visiting Cuba, the Bahamas, and various small islands. In 1892, he was again in Cuba.

During all this time he employed collectors who accompanied him and who also worked independently. One of the best of these was Daniel J. Sweeting who worked especially in the Bahamas. The collection of birds was growing rapidly and in 1892 numbered nearly 19,000 specimens, occupying three rooms in the upper story of the large house on Arlington St., Boston. As collections came in they were rapidly worked up, many new species were described, and from time to time books were published. Thus, 'The Beautiful and Curious Birds of the World,' a folio with colored plates, appeared in 1883. One of the plates in this work was of the Great Auk and furnished the original of the engraving which for many years appeared on the cover and title page of 'The Auk.' 'The Birds of Haiti and San Domingo' came out in 1885; the first 'List of the Birds of the West Indies' in 1885–6; and the completed work on 'The Birds of the West Indies' in 1889.

In December 1887, Mr. Cory had been elected Curator of Birds in the Boston Society of Natural History. This was largely an honorary position with few obligations and was held by him until 1905. When the Arlington St. house was sold in 1892 the collection of birds had been removed to the museum of the Boston Society but was not destined to remain there but to pass to a new institution in the West. At the close of the Worlds Fair in Chicago in 1893, the Field Museum of Natural History, or, as it was then called, the Field Columbian Museum, was established. The President of the new institution was Mr. Edward E. Ayer and among its trustees were several of Cory's boyhood friends and business associates. These men knew of his ornithological interests and his large collection of birds. Therefore arrangements were

made by which his birds should form the foundation of the new museum's reference collections and by which he should become the Curator of Ornithology. At this time Cory was quite independent of position and did not wish to be tied to the routine of curatorial duties. Evidently the museum had contemplated an organization in which ornithology should be a division of a department of zoology. To secure his collection of birds and to conform to his wishes, however, an independent Department of Ornithology was established with Cory as curator without residence obligations. The remaining branches of zoology were included in a "Department of Zoology, except Ornithology" in charge of D. G. Elliot. Cory was thus in effect an honorary curator and he so-called himself, but officially he was never so designated by the Museum. By agreement with the Museum, it was settled that he should hold this position during his lifetime. This agreement pleased Mr. Cory greatly since it gave him some distinction, enabled him to continue enlarging his collection without being burdened with petty details of its care, and offered no serious interference with the almost nomadic life he was leading.

Mr. George K. Cherrie was employed as Assistant Curator of Ornithology and in the fall of 1894, was despatched to San Domingo where he secured large additions to the already unrivalled collection of West Indian birds. Mr. Cherrie continued as assistant until 1897 and was succeeded in 1898 by Mr. W. A. Bryan. Later there were a few years without a regular assistant until 1904 when Dr. Ned Dearborn was appointed. During this period and until 1906, Cory visited the Museum one or more times annually, made recommendations of a general nature, and then returned to Massachusetts. His own idea of his relation to the institution is very clearly expressed in a notation by himself found in his personal records. This is as follows, under date February 6, 1894:

"Signed an agreement selling my collection and working library only, now in Boston Society Narural History Museum in Boston, to the Field Columbian Museum in Chicago, and have accepted the position of Curator of Ornithology in the museum which is a high, compliment. I am at liberty to work as much or little as I please, but must direct the general government of the collection."

During this period of absentee curatorship, one of Mr. Cory's

activities was the publication of a number of popular books. Beginning with a new edition of his 'Hunting and Fishing in Florida,' issued in attractive and well illustrated form in 1896, there followed a series of handy manuals for the identification of birds. The first of these was called 'Key to the Water Birds of Florida' and appeared in 1896. This was followed in 1897 by 'How to Know the Ducks, Geese and Swans' and 'How to Know the Shorebirds.' These came out in paper covers for a small price and had a considerable sale among sportsmen rather than ornithologists, but they attracted the attention of ornithologists owing to the ingenious way in which their purpose was achieved. At this time, Coues' 'Key' and Ridgway's 'Manual' were still in vogue and the numerous pocket keys and other convenient aids for the novice which we now have were unheard of. Cory's keys were illustrated keys, dichotomous and brief, but with a woodcut of a head, a foot, or other unmistakable part of each species set into the text. Apparently they were original with him and they are to this day about as near foolproof as anything that has been devised for the identification of birds. As a culmination of the series, a key to 'The Birds of Eastern North America' in two parts was prepared and published in 1899 and 1900 in two editions, one by a Boston publisher for general sale and a special one by the Field Museum for distribution to its mailing list. This was the first important publication of Cory's authorship to be issued under the imprint of the Field Museum.

A few years later, in 1906, a crisis came in Mr. Cory's life. This was nothing less than the complete loss of his fortune. The ruin was practically unmitigated and took all his property save personal effects, reducing him in a few months from a man with the income of a millionaire to one required to earn the daily bread of himself and family, and he a man in middle age who had never earned a dollar in his life. The cause of the crash is of little importance now, but it may be said that it was principally due to heavy speculation in the so-called securities of the famous "shipping trust" and "sugar trust," speculations to which he had been induced through the advice of men much wealthier than himself and upon whom he depended to carry him through. This they could not or would not do and, since another of his properties

collapsed at the same time, the settlement of his obligations was quite beyond his means. Samuel Butler it is, I think, who somewhere says that the one thing from which no man recovers is the loss of his fortune. That Mr. Cory never recovered was evident to his close friends, but if he was inwardly embittered and broken in spirit, it was usually well concealed. His sense of humor never left him and he made a brave fight to the end, ornithology proving to be at once his salvation and his refuge. From a roving amateur he became a diligent professional. His position with the Field Museum was purely honorary and carried no salary. A salary had become a necessity and so a salaried position was provided for him at the Museum, that of Curator of Zoology. At the age of fifty he removed with his family to a small house in Chicago, renounced most of his former friends and associates, and settled down to a life of routine utterly different from the one he had been leading. His favorite recreation, the game of golf, was still possible to him and, although he was obliged to play at a small and inexpensive club, he continued to get much enjoyment from it. In later years, through infirmity, even this was denied him.

For fifteen years he came regularly to his desk at the Museum and worked diligently in the study of birds and in the preparation of ornithological books. Details of the work in the several divisions of his department were left largely to the assistants in charge. Far from being domineering or wilfully meddling, he seldom took the initiative and with few exceptions the men subordinate to him were treated with the utmost consideration. He immediately began the preparation of a book on 'The Birds of Illinois and Wisconsin, which the Museum published in 1909, a large well illustrated volume of 750 pages. Meanwhile his assistants Ned Dearborn and John Ferry were sent to collect birds in Central and South America and especially on islands of the Caribbean Sea from which collections would supplement the large West Indian collection of the Museum. Following the work on the birds, he produced a similar one on the 'Mammals of Illinois and Wisconsin,' a volume of 492 pages published by the Museum. This was done to a certain extent as an answer to unwarranted criticism intimating that he was solely an ornithologist without knowledge of other branches of zoology. It was an excellent piece of work, well

illustrated with maps, line drawings, and photographs, provided with keys for identification, bibliography, and glossary. Although largely a compilation, it contained many original notes on the habits of species known to him in former years. It is today one of the best works yet produced on the mammalogy of a political division of the United States. Such assistance as he received from professional mammalogists was largely general or advisory and the work therefore was entirely his own production.

Upon my own association with the Field Museum in 1909, Mr. Cory entered heartily into plans for continuous study of the fauna of South America and, although nominally subordinate to him, I was given a free hand in the employment of men and in the planning and conduct of expeditions. In the field work which followed in Central America, Venezuela, Colombia, Peru, and Brazil, my recommendations were invariably approved by him, his only request being that birds should constitute a fair share of the collections made. During the next few years, in which quantities of fresh South American material were being received at the Museum, he occupied himself with the description of new species and in reorganizing voluminous bibliographic matter accumulated in previous years. This led to the conception of his last and most ambitious work, 'The Birds of the Americas,' and when, through embarrassment of the Museum's finances in 1913, field work in South America was discontinued, he was already becoming so engrossed in the compilation of this great work that he was less disturbed and disappointed than might have been expected. The amount of labor which he expended in preliminary work for this series was prodigious and when it came to the actual production of the first volume he left no stone unturned in order to make it as nearly complete and reliable as possible, at least up to the point of going to press. He corresponded with many ornithologists in this country and abroad concerning particular points, he followed up each case to the end, often personally paying for transcription and translation of matter in books not to be found in Chicago libraries. One thing he would not do, and that was the reading of his own proof carefully page by page. This was not on account of inability on his part, for as amply shown in other connections, he was, if he chose to be, a master of detail and a

marvel of accuracy. But proof reading he looked upon as drudgery and, doubtless through habits formed in earlier life when he was able to hire the best of assistance, he regarded a book finished when the manuscript went to the printer. Consequently 'The Birds of the Americas' and some of his other books were marred by typographical errors the number and importance of which varied according to the competence or incompetence of the clerks who happened to be in his employ when they were issued. Preparing the manuscripts, however, was another matter and this he did most scrupulously all in his own hand. The first part of 'The Birds of the Americas' appeared in 1918 and the second in December 1919. The third part was ready for the printer shortly before Mr. Cory's death and the manuscript of a fourth was approaching completion. His devotion to this work during his last days was most pathetic. In November 1920, he was stricken with a partial paralysis which left him able to move about and sit at his desk in his own home but unable to go to his office in the Museum. For the next eight months, although it was evident to his family and close associates that the end might come at any time, he himself showed no signs of any such belief and continued hopefully insisting that he could recover at least sufficiently to finish his book. The book and ornithological matters were uppermost in his mind and furnished almost the only subjects upon which he would talk to his Museum associates who visited him in these days. Specimens and books were taken from the Museum to his house and each day he put in a short time working or trying to work on the manuscript of the book. In July 1921, he went to a resort where cool weather might be expected and near there in a hospital in Ashland, Wisconsin, he died on July 31, after an acute illness of only a short time.

In the foregoing account of his life, his interest in ornithology has been dwelt upon especially. To understand him it was necessary to know his whole history. Ornithology was to him only one of the numerous sports which life afforded. It was all play to him and no one played with greater zest than he. His friends among ornithologists were few. For Brewster and Ridgway and Chapman he seemed to have a real affection and toward all the bird men of his own generation he was fraternally inclined, but for most of

his life his personal associates were not ornithologists. His contributions to ornithology are large. His bibliography, not yet compiled, includes well over 100 titles many representing books of considerable size. He discovered and described many new species and subspecies of birds and was directly or indirectly responsible for a large amount of exploration. At least seven species of birds were named in his honor and two, Cory's Least Bittern and Cory's Shearwater, bear his name although having technical names not referring to him. One large mammal, the Florida cougar *Felis coryi*, was named in his honor.

To those who knew him, perhaps the characteristic that will be recalled most was his great capacity for discovering the humorous side of every situation. My first meeting with him was the occasion for him to relate some amusing stories in his office at the Field Museum and when I last saw him a few weeks before his death he even joked about his own pitiable condition. A good story was his delight and he never missed an opportunity to tell or to hear one. He was always fond of writing stories and never doggerel for circulation among friends. In the small circle of ornithologists who from time to time sent out round robin jokes directed at each other's foibles he was usually to be counted on for an amusing contribution. Once Robert Ridgway sent him a fabricated composite specimen saying that he was about to name it in his honor as a new species. Cory, seeing a chance to turn the joke back, immediately telegraphed that he was greatly pleased, that he had prepared a colored plate of the specimen which he would have published at once with Ridgway as authority, and that he was sailing that day for the West Indies and thence-forth would be out of communication. His sense of the ridiculous, fondness for stories and a large human sympathy were expressed in several non-ornithological works, one of which was called 'Doctor Wanderman' and another was an interesting collection of short stories issued under the title 'Montezuma's Castle and Other Weird Tales.' Among the unpublished manuscripts left by him are two nonsense works prepared and illustrated with considerable care in the hope that they might produce some much needed additions to his income. One of these was called 'Tales of a Nature Faker' and included some very clever items.

No account of Mr. Cory's life would be complete or fair which did not record his prowess in athletic sports and his love of games of all sorts. Most of his friends among ornithologists knew he had some reputation as a golf player, but probably very few of them realized how skillful he really was at this difficult game, or how he excelled in various other games and in other activities outside of ornithology. His interest in these things is not only a matter of record, but it is very important in estimating the character of the man. They were all games of skill and games in which supremacy was most severely contested. They required great physical control, accuracy, judgment and generalship. He played them all to win, he studied them from every angle, analyzed their every feature, concentrated on them, and never ceased until he excelled. This meant nothing less than hard work, very hard work, and a great deal of it. Incessant study and practice are necessary in making champions and without them native gifts cannot be developed.

As a boy, like most boys in Boston, he took up baseball, played a great deal, and was one of the first in the country to pitch the so-called curve ball. Next he became interested in shooting, especially pistol shooting, and became one of the best pistol shots in the United States. It is related by a freind, who was once his guest in Florida and who innocently proposed some pistol shooting to while away an hour, that Cory suggested a visiting card as a mark. To this the guest agreed but when actual preparation began he was aghast to find that Cory intended shooting at the edge of the card instead of its face. While still in college he began playing billiards and became so expert that the attendant notoriety was distasteful and when he won the billiard championship of the state of Massachusetts he did it under an assumed name. Later while in Europe, he once met the billiard champion of Belgium in a friendly match and defeated him. At one time he was interested in whist and played with some of the best players of that period.

He began playing golf in 1897, being one of the first to take up the game in America. From that time until 1915, golf was his principal recreation. At the Great Island Club in Massachussetts, of which he was the principal founder, he laid out what was practi-

cally a private golf course. In 1902, he won the North and South championship at Pinehurst, North Carolina. Later he was champion of Massachusetts, champion of Florida, and winner of many special events for which he received more than 100 prizes including no less than 75 silver cups. He wrote occasional articles for golfing magazines, he designed several special golf clubs, he invented and patented an apparatus for playing indoor golf, and his exhaustive knowledge of the game, its history, personnel, and everything pertaining to it was a marvel to the younger golfers with whom he came in contact in his later years.

For a number of years he was much interested in music. He had a good baritone voice and sang a great deal although seldom in public. He founded the Boston Glee Club and helped it along not only by his own voice and membership but by money contributions. He wrote the words for several light operas and one of these, called 'The Corsair,' was produced in Boston for the benefit of the Marine Biological Laboratory of Woods Hole. He also wrote the words for 'A Dream,' a very popular song often sung by prominent vocalists, including the late Enrico Caruso. Another subject to which he devoted considerable time was psychic research. In 1888 he was made chairman of a committee on hypnotism in the American Society for Psychical Research and he published two small treatises entitled 'Hypnotism or Mesmerism' and 'The Therapeutic Value of Hypnotism.' In this connection he spent much time and money in exposing tricksters both in this country and abroad. He never was able to believe that communication with the dead was humanly possible and he freely scoffed at theories involving such belief.

Despite the number and variety of the activities in which he zealously engaged, there was never a time when ornithology was crowded out and there can be no doubt that from end to end his greatest devotion was to the study of birds. As a boy in his teens he began to contribute to the literature of birds and until the day of his death he was a productive worker in the field of taxonomic and geographic ornithology. In later years, aside from incidents of failing health, the conditions under which he worked were such as to have discouraged a less determined man. The diligence and tenacity of purpose with which he pursued the tremendous

task of preparing his last book was truly remarkable. It has been said that ornithology to him was a game—the greatest and best game he played. If so, he played it like other games, to win, and none knew better than he that winners never quit.

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THE BREEDING HABITS OF THE BARNACLE GOOSE.

BY F. C. R. JOURDAIN, M. A., M. B. O. U., C. F. A. O. U.

Plate V.

UNTIL the season of 1921, all that was definitely known of the breeding of the Barnacle Goose, (*Branta leucopsis* (Bechst.)), was due to the efforts of two ornithological workers, Dr. Alexander Koenig of Bonn, Germany, and Mr. A. L. Y. Manniche of Denmark. The few earlier breeding records are all of a more or less doubtful character. In 1858 a Goose and a nest of eggs were brought to the Swedish Expedition under Nordenskiöld by the harpooner of a sealing sloop from some locality near Bell Sound, Spitsbergen, but it is by no means certain that the bird was shot from the eggs and probably the eggs were found on one of the islets in the bay and belonged to *Branta b. bernicla.* A supposed case of breeding on the Lofoden Isles, Norway, in 1870–1872, was reported by Collett, but the eggs are remarkably small for this species, and the locality lies far outside the normal breeding range, so that even if no mistake was made, probably one of the birds was prevented from migrating by some injury. A nest with eggs from which the gander was shot is said to have been found by Nathorst and DeGeer in 1882 in Bell Sound, Spitsbergen, but here again there are discrepancies in the various accounts, Lieutenant Stjernspetz informing Mr. A. H. Cocks that three young were taken. In 1913, Mr. H. Noble was shown a clutch of five eggs and down which were said to have been taken in Iceland in 1912 (cf. British Birds (Mag.) X, p. 181).

The first really authentic information on the subject however, comes from Dr. Koenig, who gives full details of his discovery in his 'Avifauna Spitzbergensis,' p. 222–226. On June 29, 1907, he found a small breeding colony in one of the side valleys leading



NEST AND EGGS OF THE BARNACLE GOOSE.

into Advent Bay, and on the following day obtained two clutches of five and four eggs respectively, besides shooting three males and two females. In 1908 he returned to the same spot, but though about eight pairs were breeding in the valley, only one nest proved to be accessible, which contained three incubated eggs on June 15. These twelve eggs, still in Dr. Koenig's fine collection at Bonn, remained the only authentic specimens taken from wild birds until 1921. Perhaps the most curious feature about these nests which has no doubt been the principal factor in preserving them from molestation, was their unusual position. In Spitsbergen it is not uncommon to find outcrops of rock occuring at intervals along the sides of valleys, and although undergoing a slow process of disintegration, and split by frost, they still stand out from the steep hillsides in great masses, often with perpendicular sides, leading down to a talus of broken rocks below. Here it is, on these "bastions" as Koenig aptly terms them, that the Barnacle Goose elects to breed. Sometimes the nest may be found on a mossy ledge at the foot of a steep crag, with a drop of fifteen to twenty or thirty feet below. At other times a narrow rock spur, projecting out into the valley from the hillside is chosen, while in some cases birds have been seen incubating their eggs at the top of some rock pinnacle or in a hollow in the face of an overhung cliff.

In 1910, Mr. A. L. V. Manniche, who accompanied the Danish Expedition to Northeast Greenland in 1906–1908, published his ornithological and other notes in the 'Meddelelser om Grönland.' Bd. XLV. Here he describes how in June 1908, he discovered a great breeding colony on the steep face of a mountain over 1100 feet high. The birds were breeding on ledges on the upper half of a great cliff, and even at a distance of three-quarters of a mile the noise of their notes was distinctly audible. Manniche estimated the number of breeding birds at about 150. Unfortunately he was unable to reach the nesting places or even to ascertain with certainty whether they had actually begun to breed. An interesting feature of this colony was the presence of an eyrie of Greenland Falcons among the geese.

The spring of 1921, when the Oxford University Expedition visited Spitsbergen, was a remarkably open one, and there was very much less snow than in normal years. We were, however,

rather later than we had expected to be in reaching Advent Bay and it was about 11 P. M. on the night of June 25 that a small party, consisting of Messrs. A. H. Paget Wilkes, S. Gordon and myself, set out to work one of the valleys leading down to the bay. The sun was still shining and the weather still and fine as we made our way along the side of the desolate looking valley, on the opposite side of which many snow wreaths still lay. A succession of gray bluffs half way up the long slope of the mountain side looked promising and we slowly toiled over the loose talus towards them, scanning the crags closely with the glasses in the hope of seeing the white face of the setting bird or her mate. We had not gone very far before a goose appeared flying down the valley towards us and was presently joined by a second, which must have come from one of the bluffs. Both birds seemed anxious and uttered a cackling note, and as they came near we recognized the boldly contrasting black and white plumage and the characteristic white face of the Barnacle Goose. Round they went away again up the valley, one bird finally settling on the top of a big rocky bastion. This was most encouraging, and once more the glasses were turned on the rocks ahead of us. Half way up a steep rock face perhaps a kilometre ahead there was a white speck, and as the glasses were directed to it, it seemed to move. The exact spot was hurriedly pointed out to the others and Mr. Wilkes at once set off towards it. As he gradually came nearer first the gander and then the goose left the bluff but the latter was most unwilling to desert her highly incubated eggs and sat with outstretched neck till at last her fears got the better of her. The nest contained five eggs and a plentiful supply of down and feathers, as well as a good many droppings. It was not particularly difficult to reach from above, and a short scramble was all that was needed before the eggs and down were in the collector's hands. Time was pressing as we had arranged for our ship to leave at midnight, but fortunately before turning back Mr. Wilkes decided to try another bluff still further up the valley. Here on a projecting spur of rock jutting out over the valley, some hundreds of feet below was a second nest containing four eggs in a neat down-lined hollow. Flakes of down were scattered over the rocks, while numerous droppings marked the place where the gander kept watch beside

his mate. The accompanying photograph (Plate V) is curiously deceptive. The high walls of the opposite side of the valley and the snow drifts in the gullies come out clearly and the marshy flats at the foot of the valley can also be well seen, but the rocky spur in the foreground, on which the nest is situated, might well be only a few feet above the flats below, instead of being two hundred feet or so above them.

A second visit a few days later was even more successful. On this occasion no fewer than three nests were taken, containing five, five, and three eggs respectively. All three clutches were highly incubated and many hours of painstaking toil were spent before the last bone was safely extracted. Besides these nests, there was also another breeding place in a small cave in the face of an overhung and very rotten cliff, which could only have been reached at the expense of much time and considerable risk. High up above us was a great cliff face, and here I plainly saw a goose stand up for a minute or two and then disappear again on to a ledge. Another bird settled on a mushroom shaped pinnacle of rock on which her head could just be seen silhouetted against the sky, where she is probably safe against all comers for many years to come.

It is evident that the habit of nesting on cliff faces has been adopted by the Barnacle Goose and to some extent also by the Pink-footed Goose—as a protection against the attacks of the Artic Fox. Many of the nests must be quite inaccessible, while in other cases, the mammal is at a very great disadvantage on a ledge with a drop of anything from fifteen to fifty feet below and a couple of angry geese, as much at home in the air as on land. Unlike the ducks, the Anseres have a high standard of duty on the part of the husband. Although the male takes no share in incubation, and incubation patches are only found in the females, the males spend most of their time on sentry duty beside their mates. Not only is the gander always on the watch and ready to give the alarm, but he is also prepared to take his share in defence if any occasion should arise. In every case where we found geese breeding in Spitsbergen, whether Pink-footed, Brent or Barnacle, the male bird was standing by the side of his mate. There is, however, one disadvantage of the cliff nesting habit, which would seem at first to offer almost insuperable objections. The

young of most cliff breeders remain in the nest till they have acquired the power of flight, while the young geese on the other hand are vegetable feeders and can pick up their own living almost as soon as their down is dry, but as the parents have no means of conveying food to them, they must necessarily leave the nest within a day or so, and probably within a few hours of being hatched. It seems almost incredible that goslings should survive a fall from the nest on to a talus of rough broken rocks many feet below, with the prospect of a long and toilsome journey down to the river flats below over screes and boulders. From what we saw in the case of the Pink-footed Goose, however, I am inclined to believe that this is generally the case, though it is possible that in some instances the parent birds may manage to break the fall to some extent, as otherwise it would seem almost impossible for the young to survive.

It is also clear that the same nesting places are resorted to year after year. In most cases at the bottom of the nesting hollow and below the down lining, were fragments of the broken shells of some previous brood. Even when the same nest hollow is not used one can frequently discern similar hollows within a yard or two.

Only a single brood can be reared during the season, for not only is the summer short, but about mid-July or rather later the primaries are shed and the geese for the time being are rendered incapable of flight. It would therefore be impossible for them to reach their breeding places, and for safety they resort to the lagoons and swamps in the more inaccessible valleys.

In the present paper I do not propose to deal with the question of distribution of this species during the breeding season in the Spitsbergen group, but I may state that the locality discovered by Dr. Koenig is by no means the only one now known, as we have good evidence of breeding from two or three other districts, so that unless much shot down during the moulting season, the species will probably hold its own for long to come.

As the number of authentic wild-taken eggs is so small, the following figures may prove of interest. The average size of 34 eggs (22 taken by the Oxford Expedition and 12 by Koenig and LeRoi) is 76.37 × 49.81 millimeters: Maxima 82.7 × 46.4 and

77.6 × 52.7: Minima 70.6 × 50 and 82.7 × 46.4. The average weight of 10 eggs is 10.252 grammes, Max. 11.42; Min. 9.49 When fresh laid they are pure white, and bear a great resemblance to eggs of the Pink-footed Goose, but are somewhat smaller. They are, however, larger than those of the Brent on the average, besides being considerably heavier. The amount of down in the various nests varied considerably: probably in some cases a certain amount remained in the nest hollow from the previous year. We found no black feathers in the nest: all were either white or had only a faint greyish tinge.

On the whole the Barnacle Goose is decidedly a sociable species, and prefers to breed in colonies. In the Greenland colony described by Manniche the nests were evidently quite close together and two of the nests seen by us, were certainly not twenty yards apart. There is also good reason to believe that a much larger breeding place exists in Spitsbergen than that described above. When flushed from the nest the birds would join together in little parties of two, three or four, or even as many as seven, and fly anxiously up and down the valley, keeping up a continual cackle. For a goose, the Barnacle is not particularly shy, and it was curious to see the gander regarding us with an inquiring air, with head upwards as we looked down on to the nesting ledge from the hill-side fifty feet above him. When incubation is far advanced the goose sits very closely, and on one occasion I walked up a narrow track on to a ledge about half way up one of the bastion-like bluffs from the side, to within a few yards of a setting goose, in spite of the fact that a couple of shots had just been fired not fifty yards away and a dead bird from a neighboring nest lay on the rocks below.

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FLIGHT SONGS AND MATING SONGS.

BY ARETAS A. SAUNDERS.

SOME time ago, discussing the evolution of bird song (Auk XXXVI, pp. 149–151) I stated my belief that the mating songs of birds were more ancient in origin than ordinary songs, giving as an example the Eastern and Western Meadowlarks (*Sturnella magna* and *S. neglecta*). Later, Mr. Francis H. Allen, in an article on this subject (Auk XXXVI, pp. 528–536) discussed this case with some others, and gave some facts which seemed to him to prove that ordinary songs are more ancient than flight songs. Having given this subject a little more thought in the light of Mr. Allen's remarks, I have something more to add to the discussion.

Mr. Allen's conclusions appear to be entirely right. Such a flight song as that of the Ovenbird (*Seiurus aurocapillus*) does appear to be a more complicated development from the ordinary song. This seems to be true also of the flight songs of many other species, such as the Song Sparrow (*Melospiza melodia*), Maryland Yellow-throat (*Geothlypis trichas*), and McGillivray's Warbler (*Oporornis tolmiei*). But are these flight songs mating songs? A true mating song, if such a song distinct from the ordinary one is possessed by the species, should be confined to the season of courtship. In my experience the flight songs of these species are uttered most frequently late in the season, after the birds have chosen mates and begun nesting. It is true that I mentioned some of these songs in my letter as mating songs, but thinking the matter over I am doubtful of this. The flight songs of the Meadowlarks and the mating songs of the Robin (*Planesticus migratorius*) are confined to a very short season in April, when birds are choosing mates, and are very rarely sung at any other time. For this reason I believe they are true mating songs.

Mr. Allen mentions a song of the Black and White Warbler (*Mniotilta varia*) as an example of a mating song that is evidently a more complicated development of the ordinary song. At the time of reading his article I was not familiar with any such song. During the past summer I have paid more attention to the song of this species, and have heard several variations from the ordinary

type, some similar to, though not exactly like the song Mr. Allen describes. These variations however, were none of them heard until June and July after the species had been nesting for some time. The first one was noted on June 13. The nesting of this species begins in May in this region. In one case I found a bird of this species nest building at New Haven on May 10, a nest in which the last one of four eggs was laid May 20. This may have been a little earlier than normal time of nesting, but even so the mating song of this species, if it has one, should be sung mainly in the first half of May. I doubt, therefore, that the songs I heard were mating songs.

There seems to be a tendency on the part of a number of species to vary the song late in the season, too late for the variations to have any mating significance. I have noted such variations in the Yellow-throat, Field Sparrow (*Spizella pusilla*), Wood Thrush (*Hylocichla mustelina*), and others. The case of the Black and White Warbler I believe belongs with these, as does also that of the curious second song of the Blue-winged Warbler (*Vermivora pinus*). What significance there in is these songs, is a problem to be worked out.

To take up the question of the Meadowlarks again, the flight song of the eastern species is certainly not a common one. The fact that it is almost entirely confined to a short season in the month of April makes it even less commonly observed. I agree with Mr. Allen that the ordinary song of this species is sometimes a mating song, as it is often sung on the wing, when in pursuit of a mate. It may be the fact that this song is useful as a mating song, that has caused many individuals to drop entirely the use of the more ancient type. Looking over my notes on this song, shortly after reading Mr. Allen's article, I could find no reference to the flight song of this species except in the month of April. I was about to conclude that it was entirely confined to this season, when a day or two later, on November 1, 1919, a bird favored me with the full flight song. This came in time to teach me that I could not make hard and fast rules about how and when a bird will sing. There seems every reason to believe, however, that this song is sung mainly in April and is a true mating song. My notes on it reveal another fact that may or may not be significant.

I have never heard this song sung except near the sea coast, by birds that breed in salt marshes. In fact I have heard it in only two localities, one at West Haven and the other at Norwalk. In these localities, however, it seems to be quite common in its season.

Concerning the flight song of the western species, it is more commonly heard than that of the eastern, at least in the state of Montana. Since little or nothing has been written about it and first-hand descriptions are better than those taken from memory, I submit the following description from my note book, dated at Helena, Montana, April 9, 1911. "The flight song differs from the ordinary one in quality, being less like the Oriole and more like the Bobolink. It begins with two or three clear low whistles, rendered from the perch before flight. After this introduction the bird rises into the air and starts a long-continued song very similar to that of the Bobolink. The first introductory notes sound like the call-note of the eastern Bluebird, though louder and somwehat lower in pitch." At the time this was written I had never heard the flight song of the eastern bird. I have, of course, never heard the flight songs of the two species where I could compare them, nor have I ever made accurate records of either one. My statement that they are much alike is based upon memory of the western song when comparing it with the eastern. As far as memory goes, except for the introductory notes, which are absent in the song of the eastern bird, the songs are practically identical.

If these songs are not ancient enough to go back to the time when the two species were one, and therefore more ancient than the ordinary songs, then the similarity between them is a most unusual coincidence. Having heard the flight songs of both species, I could be as easily convinced that the similarity in plumage of these two species is not ancestral, as that the similarity of their flight songs is not. Since the songs are evidently mating songs, and used almost exclusively in the mating season, the mating song in these species must have been the more primitive. It is true that these flight songs are longer and more erratic than the ordinary songs, as is the case with flight songs of most species; but they are also less pleasing or clearly musical in quality. This

is the contrary in such a flight singer as the Ovenbird. The ordinary song, therefore, even though shorter in duration than the flight song, is on a higher plane of song evolution, and, I believe, of more recent origin.

Concerning other flight songs, those of the Baltimore Oriole (*Icterus galbula*) and the Rose-breasted Grosbeak (*Zamelodia ludoviciana*) appear to be mating songs, and as Mr. Allen suggests, they appear to be elaborations of the ordinary song. They are probably evolved as he suggests, and are more recent in origid than the ordinary song. Those that I have mentioned above, that do not appear to be mating songs, because sung too late in the season, may possibly be steps in the adoption of a flight song by the species in question. That is, there are some species in which the flight song is the ordinary song, such as the Meadowlark, the Bobolink (*Dolichonyx oryzivorus*), the Longspurs, and Sprague's Pipit (*Anthus spragueï*). These birds are all ground nesters. In acquaintance with the singing habits of five of these species I might say that I have never known Sprague's Pipit to sing in any other manner than on the wing. McCown's Longspur (*Rhynchophanes mccowni*) sings from a perch only very rarely. The Chestnut-collared Longspur (*Calcarius ornatus*) sings from a perch more frequently than McCown's, but still rarely, while the Bobolink and Horned Lark sing from a perch about as frequently as on the wing. Now all these species sing so frequently on the wing that their flight song is in no sense a special mating song. Is it not possible that the other species, Ovenbird, Yellow-throat, Song Sparrow etc., birds that also nest on the ground, are slowly developing the flight song as an ordinary song? The true flight singers nest in open grass areas, in places where perches are hard to find. Those that have occasional flight songs nest in woods or thickets where perches may be had if desired. Perhaps the frequency of perches has kept the flight song from developing in these species as it has in the prairie birds. If in some future time, something should change the habitat of these species to more open regions, it is probable that true flight song would develop quickly.

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BIRDS OF FROST VALLEY, SLIDE MOUNTAIN REGION, SOUTHERN CATSKILLS.

BY MARY WOOD DALEY

In 1884, Eugene P. Bicknell wrote of the birds of Slide Mountain and near vicinity in the Catskills (Transactions Linnaean Society New York, Vol. 1–3, 1882–84). Ever since I found his valuable and interesting papers, I have been eager to add my small contribution to the bird knowledge of the same region. I have had an unusual opportunity for observation, have kept careful bird lists and, in recent years, detailed nature notes. The observations have been made from early June to middle or late September from 1908, until this year, 1920, omitting only the summer of 1914. The last three years have been devoted to very careful study.

Frost Valley is the name given by the natives to a sheltered valley extending south-westerly from Slide Mountain, the highest mountain in the Catskill group. This mountain is part of the Hudson-Delaware watershed. The Esopus flows into the Hudson, the Neversink into the Delaware, and each has its main spring sources on the slopes of Slide. The Neversink originates in two small streams called the East Branch and the West Branch, and it is the valley of the West Branch that is called Frost Valley. About four miles south-west of Slide Mountain, along this valley, stands our cabin.

We have called it "Tree Tops," and it is in the region near it that I have made my most careful bird records. Our latitude is a few seconds below the parallel of 42° North; our longitude approximately 74° 31′ West. The altitude is about 2100 feet above sea level. Wildcat Mountain rises to a height of 3268 feet immediately in front of us, and nearly due south (U. S. Geological Survey; Topographic maps; Slide Mountain Quadrangle).

The nearest village, formerly a center of the tanning industry, is Claryville in Sullivan County. It is nine miles by road west and south of us. The nearest railroad station is Big Indian in Ulster County on the Ulster and Delaware Railroad between Kingston and Oneonta, about thirteen miles to the north. To reach it we have to drive over a high spur of Slide Mountain.

I have been assisted in my observations by my brother, C. S. Daley and my sisters, Alice Wood and Marjorie C. Daley.

The region studied includes the state trail to Slide Mountain summit, and all of the valley extending in a general south-westerly direction for about eight miles from Slide. For convenience, I am dividing the notes under two heads, one on Slide Mountain birds, another on Frost Valley observations.

The climate for the whole region is usually cold in June, cool in July and August, cold in September. We have seen black frosts in June and September and frosts in early July and late August. It is difficult to raise any but early corn, and very nearly impossible to grow ripe tomatoes. We seldom have strong winds, or weather that is uncomfortably warm or humid. The general geological history of the region is well known. The Catskill Mountains, so-called, are the eroded and dissected remains of an ancient Devonian plateau. The rocks are sedimentary, mostly non-fossiliferous sandstone, contemporary with the Chemung deposits of the western and central portion of New York State. There are a great many loose rocks and boulders all through the valley, in woods and clearings alike. All that I have found are the characteristic sandstone.

Formerly this valley boasted many large hemlock trees, but forty or fifty years ago they were cut down, and the bark used for tanning purposes. The great moss-covered logs of these trees are a characteristic part of much of the portion of this region. There are some hemlocks still, and many firs, but the predominant trees are deciduous, mostly beech, yellow birch and four species of maple. Besides these, in much smaller numbers, we find basswood, mountain ash, hornbeam, black cherry (*C. serotina*), "fire" cherry and quaking asp. Shadbush (*Amelanchier*) is common and the berries are a favorite food of thrushes.

Dotted along the roadside as it follows the West Branch stream through the valley, are more or less frequent clearings, varying from rough pastures to fairly good meadows and gardens patches. When we came here in 1908, there were fourteen native homes, with families varying from two to ten people, interesting, helpful mountain folk, the best of neighbors. There was one large estate which was sold in 1916 and the present owner has increased the

estate, buying up nearly all the "native farms." The people have gone away, several clearings once occupied, especially near "Tree Tops," are deserted and neglected, and the woods are taking back their own. I speak of this because in the "Tree Tops" vicinity it has meant a change in the abundance of certain species of birds.

ANNOTATED LIST OF BIRDS.

I. SLIDE MOUNTAIN.

Altitude 4204 feet. Observations from the Winnisook Club (altitude 2800 feet) up the state trail to the summit; seven or eight trips to the top and back, in June, July and August. At the summit the characteristic growth consists largely of weather-worn firs. This past June we found a few canoe birches. The woods are dry above 3000 feet.

Bonasa umbellus umbellus. RUFFED GROUSE; PARTRIDGE.—It is quite usual to surprise a covey of partridge near the trail.

Empidonax minimus. CHEBEC; LEAST FLYCATCHER.—One record.

Zonotrichia albicollis. WHITE-THROATED SPARROW.—On every journey to the summit of Slide I have been refreshed by the song of the White-throated Sparrow. I have seen it only on or near the summit. Recorded in June, July, and August always in song. I have found the sparrow nesting in the Tannersville region of the Catskills, but in Frost Valley I have found it only in migration in May and late September.

Junco hyemalis hyemalis. JUNCO.—This bird has been seen on every trip up Slide at any part of the trail and on the summit. On July 25, 1919, I found a nest with four eggs. One of the parent birds was flushed from the nest which was tucked away in a moss-covered ledge cavity about halfway up the mountain.

Vireosylva olivacea. RED-EYED VIREO.—Common.

Mniotilta varia. BLACK AND WHITE WARBLER.—August 9, 1920.

Dendroica caerulescens caerulescens. BLACK-THROATED BLUE WARBLER.—Several records.

Dendroica magnolia. MAGNOLIA WARBLER.—Several records. One in June, 1920.

Dendroica pensylvanica. CHESTNUT-SIDED WARBLER.—Common.

Dendroica fusca. BLACKBURNIAN WARBLER.—Heard June 27, 1920.

Dendroica virens. BLACK-THROATED GREEN WARBLER.—Usual.

Seiurus aurocapillus. OVEN-BIRD.—Heard frequently, seen several times.

Wilsonia canadensis. CANADA WARBLER.—Usual.

Setophaga ruticilla. REDSTART.—August 9, 1920.

Nannus hyemalis hyemalis. WINTER WREN.—Pair seen July 25, 1919. They had worms in their mouths and much alarm was shown. Song heard June 27, 1920.

Certhia familiaris americana. BROWN CREEPER.—July 25, 1919, only record.

Penthestes atricapillus atricapillus. BLACK-CAPPED CHICKADEE.—Common.

Hylocichla aliciae bicknelli. BICKNELL'S THRUSH.—Seen several times and heard. On July 25, 1919, saw a pair much disturbed, worm in mouth of one bird; evidently nesting.

Hylocichla ustulata swainsoni. OLIVE-BACKED THRUSH.

Hylocichla guttata pallasi. HERMIT THRUSH.—Seen and heard several times. Usual.

A Nuthatch was heard August 9, 1920. Species uncertain. I searched in vain for the Philadelphia Vireo, Black-poll Warbler, Myrtle Warbler and Red Crossbill. The last three were reported by Mr. Bicknell. A pair of Hawks, either Sharp-shinned or Cooper's, were seen flying overhead August 9, 1920.

II. FROST VALLEY.

In this valley are two kinds of bird environment—the cultivated, sparsely inhabited clearings and homestead lands, specially concentrated and continuous about five miles from Slide by road, and a mile west of "Tree Tops;" and the wooded rather wild districts along the mountain streams, and on the slopes of the ridges. They mingle and overlap, so there is no sharp distinction to be drawn. However, I find in the cultivated areas about dwellings that the predominant birds are, as is to be expected, Bluebirds, Robins, House Wrens, Barn Swallows, Cliff Swallows, Goldfinches, Song and Vesper Sparrows, while in the wooded portions and neglected wild clearings, like our own at "Tree Tops," the common birds are warblers and thrushes. The altitude varies from 1800 feet above sea level to 2800 feet. Most observations were taken at our cabin, 2100 feet above the sea.

Botaurus lentiginosus. BITTERN.—One record, West Branch stream above small mill dam, July 22, 1911.

Butorides virescens virescens. GREEN HERON.—Two records, exact dates lost.

Helodromas solitarius solitarius. SOLITARY SANDPIPER.—Usual along streams. Earliest record July 7, 1912. July 13, 1920, many August records. The natives call this bird the "tip up" because of its

habit of teetering as it walks along the edge of streams, or on the mud beaches of pools.

Bonasa umbellus umbellus. RUFFED GROUSE. PARTRIDGE.—Common summer resident. Several records each season. The drumming of the male is one of the favorite sounds of our woods. We hear them frequently in June and again in September. It is not at all unusual throughout this region to surprise a covey of partridges, an anxious mother and several young.

Zenaidura macrour acarolinensis. MOURNING DOVE.—Seen in migration, late August or early September, in large flocks flying eastward up the valley, 1909, 1910, 1911 and 1918. No reason known for missing them in other years.

Circus hudsonius. MARSH HAWK.—Three records, August 9, 1918, August 1919, and August 14, 1920. Rare.

Accipiter velox. SHARP-SHINNED HAWK.—Not abundant. Six records.

Buteo borealis borealis. RED-TAILED HAWK.

Buteo lineatus lineatus. RED-SHOULDERED HAWK.—Both these hawks are usual throughout the season, but not abundant, *B. borealis* being the more common.

Haliaeetus leucocephalus leucocephalus. BALD EAGLE.—Somewhat doubtful record, because seen only in flight, twice, July 1920. The bird was flying westward down the valley, size conspicuous, white head and tail projected against mountain.

Strix varia varia. BARRED OWL.

Bubo virginianus virginianus. GREAT HORNED OWL.—Heard only, every season frequently. The natives call both of these "hoot owl."

Coccyzus erythrophthalmus. BLACK-BILLED CUCKOO.—Two nests and eggs, 1910. Seen and heard many times in our clearing, 1918, 1919 1920. Not abundant.

Ceryle alcyon alcyon. BELTED KINGFISHER.—Common summer resident. Usual along streams throughout the valley.

Dryobates villosus villosus. HAIRY WOODPECKER.—Three certain records before 1920. On June 29, 1920, and for two weeks following, often seen in the clearing.

Dryobates pubescens medianus. DOWNY WOODPECKER.—Common summer resident.

Sphyrapicus varius varius. YELLOW-BELLIED SAPSUCKER.—Usual each year. Earliest record July 2, 1919. Seen in each month. The apple trees in our clearing are marked with the regular ring of round holes in the bark due to the raids of this woodpecker.

Phloeotomus pileatus abieticola. NORTHERN PILEATED WOODPECKER.—One record; exact date lost (1909 or 1910).

Colaptes auratus luteus. NORTHERN FLICKER.—Usual, some-

times common summer resident, every month each year, throughout this region.

Antrostomus vociferus. WHIP-POOR-WILL.—One seen and call heard the same evening in September, 1917.

Chordeiles virginianus virginianus. NIGHTHAWK.—For seven seasons these birds have been seen in migration in large straggling flocks, feeding as they fly. Dates vary from August 22, 1912, to September 2 (the latter date is recorded in 1911, 1917, and 1919). They always fly eastward up the valley and can be seen for four or five hours continuously, at least fifteen to twenty-five birds in sight at a time.

Chaetura pelagica. CHIMNEY SWIFT.—Every year. A common resident. Nearly every June when we open "Tree Tops" cabin, we find one or two dessicated Chimney Swifts inside. Apparently they are caught in the fall and do not find the chimney road out. This season a Swift became caught in our kitchen range. Fortunately there were only a few dying embers in the stove and I was able to rescue him before he was injured.

Archilochus colubris. RUBY-THROATED HUMMINGBIRD.—Abundant summer resident. Often they are very familiar. I have seen one fly in the kitchen window, pass to each nasturtium on the table and fly out again. They come to bee balm (*Monarda didyma*) close to our porch. I have often seen them go to a child's bright hair-ribbon, or come within an inch of my chin, attracted by the bright red corner of the blanket on my outdoor couch.

Tyrannus tyrannus. KINGBIRD.—An occasional visitant to our woodsy clearing, but a usual summer resident in cultivated regions to the west of us.

Sayornis phoebe. PHOEBE.—Common, though not abundant summer resident. Nest frequently found, one under the ledge of our back porch, several on ledges of barns or under eaves; one inside a deserted house over the kitchen door; four, rather unexpectedly, in a rocky ledge cavity on cliffs; two near High Falls, nearly a mile from any human dwelling in deep woods; two on cliffs on the road to Claryville.

Myiochanes virens. WOOD PEWEE.—Usual summer resident. Not abundant.

Empidonax flaviventris. YELLOW-BELLIED FLYCATCHER.—Seen frequently in 1918, 1919 and 1920 with flocks of warblers in August. August 13 earliest record (1918 and 1920). Evidently a migrant.

Empidonax minimus. LEAST FLYCATCHER.—Usual summer resident.

Cyanocitta cristata cristata. BLUE JAY.—Occasional and irregular visitant. Earliest record July 21, 1920. Seen and heard nearly every season, but never for long at a time or often.

Corvus brachyrhynchos brachyrhynchos. CROW.—Usual summer resident in small flocks. Not abundant.

Agelaius phoeniceus phoeniceus. RED-WINGED BLACKBIRD.—Rare. One record in 1910 or 1911, and two pairs seen July 17, 1920, in a small meadow swamp in an open cultivated region.

Icterus galbula. BALTIMORE ORIOLE.—Never seen in the upper valley or wooded sections, but in a cultivated area near former Frost Valley P. O. we have noted a pair nearly every season. I have seen them fairly often near Woodstock and in Big Indian. On August 11, 1920, we watched a handsome male oriole bathing in the edge of the Esopus Creek.

Carpodacus purpureus purpureus. PURPLE FINCH.—Seen 1910, 1911, 1917, 1918, 1919, and 1920. The last three years they have been in full song each day in our clearing in June. Usual but not abundant.

Passer domesticus. HOUSE SPARROW.—Fortunately we are entirely free from this bird at "Tree Tops". I have seen a few pairs each year about the barns a few miles west of us.

Astragalinus tristis tristis. GOLDFINCH.—Common, often abundant, summer resident, especially in open homestead areas.

Pooecetes gramineus gramineus. VESPER SPARROW.—Common summer resident below 2000 feet altitude, and in open cultivated districts west of us, along the road to Claryville. Never seen in our clearing or east of us toward Slide Mountain.

Zonotrichia leucophrys leucophrys. WHITE-CROWNED SPARROW.—Flock reported in spring migration one year during May by C. S. Daley.

Zonotrichia albicollis. WHITE-THROATED SPARROW.—Seen only in migration in Frost Valley (several seasons in May by C. S. Daley), once late September 1917 in fall migration.

Spizella passerina passerina. CHIPPING SPARROW.—Abundant summer resident. Several nests in apple trees near the house. In 1912 a pair of Chipping Sparrows brought their young to our front porch for crumbs of corn bread. It was a great pleasure to watch the helpless young, as large as their parents, hopping around after them, cheeping for food, while the parent picked up the crumbs and stuffed them down the throats of the little birds. The young Chippies became so tame that they came to our hands, and onto our laps and shoulders, searching for crumbs. One lit on my sister's fountain pen as she held it in her hand, writing. Several times they have hopped all over my bed covers in the early morning, often coming within two inches of my face. We have tried in other seasons to attract the sparrows, but chipmunks have prevented corn bread or any other crumbs remaining long enough. This year we have a feeding shelf, protected from chipmunks, but so far it has not found favor with the birds.

Spizella pusilla pusilla. FIELD SPARROW.—Usual, but not abundant; more often in open meadow regions. Mr. Bicknell did not find it above 2000 feet but I have found it nearly every season in clearings above this altitude.

Junco hyemalis hyemalis. SLATE-COLORED JUNCO.—Common summer resident. Several nests found every year. This bird is a very attractive and characteristic bird personality for the entire region.

Melospiza melodia melodia. SONG SPARROW.—Common, often abundant, summer resident. Since the migration of the natives from our valley the number of nesting birds of this species has decreased.

Pipilo erythrophthalmus erythrophthalmus. TOWHEE; CHEWINK.—In Mr. Bicknell's experience "the Chewink seems to be a casual visitor." With us, in former years, the Chewink was a usual summer resident. We have records of several pairs in and near our clearing throughout the season, from June to September, every year from 1908 to 1916. Their notes were one of the usual sounds near us. Since 1916 they have left us. We have not heard or seen a single Towhee in this whole region. Their desertion of this valley is coincident with the migration of the natives, but whether there is any causal relation due to increasing wildness of this region, I do not know. We do not find them in the cultivated area west of us and down the valley.

Zamelodia ludoviciana. ROSE-BREASTED GROSBEAK.—Usual summer resident; never abundant. For several years we have had one in full song in June, in the woods back of our cabin.

Passerina cyanea. INDIGO BUNTING.—Common summer resident throughout the valley. Nest found in 1910, in a low sapling near the edge of our clearing.

Piranga erythromelas. SCARLET TANAGER.—Usual summer resident throughout the region.

Petrochelidon lunifrons lunifrons. CLIFF SWALLOW.—Usual, but not abundant. Several pairs and nests were observed each season on certain barns in the valley from 1908 to 1917. In 1917, 1918 and 1919 I searched in vain for nests and birds, but this year (1920) they are with us again. Nests, adults and young have been seen many times, in the same region, but not on the same barns. Not seen after August 15.

Hirundo erythrogastra. BARN SWALLOW.—Common summer resident, nearly every barn has at least one nest each year.

Iridoprocne bicolor. TREE SWALLOW.—Flock on wires in the cultivated region west of "Tree Tops." Earliest date July 18, 1910. Usual in August. Records for every year except 1913, 1916 and 1920.

Bombycilla cedrorum. CEDAR WAXWING.—A usual, sometimes fairly abundant summer resident. We have often found their nests. This year in late July, a pair came close to the house for bits of string placed on a tree for them. We watched the nesting and the safe rearing of the young.

Lanius ludovicianus migrans. MIGRANT SHRIKE.—One record of a shrike well seen close to house, and thought to be this species. A Migrant Shrike was certainly identified September 16, 1920, in Big Indian Valley.

Vireosylva olivacea. RED-EYED VIREO.—Abundant summer resident. Several nests found.

Lanivireo solitarius solitarius. BLUE-HEADED VIREO.—Migrant. Earliest date August 28, 1919. Usually seen in September with flocks of feeding warblers, Red-eyed Vireos and Chickadees.

Lanivireo flavirons. YELLOW-THROATED VIREO.—Rare. Heard several times June 1918. Seen several times in flocks of warblers about the house August 1920. I have seen it in Big Indian and in the Woodstock region. One record in a warbler flock on Round Pond Road by M. C. Daley, August 16, 1920. Heard June 27, 1920, at Winnisook Lodge, Slide Mountain.

Mniotilta varia. BLACK AND WHITE WARBLER.—Regular summer resident.

Vermivora chrysoptera. GOLDEN-WINGED WARBLER.—Migrant. Not known here until 1918. Since then it has been seen here each year in late July and August in flocks of other warblers. In 1920 it was late in arriving (August 23) and very few in numbers.

Vermivora rubricapilla rubricapilla. NASHVILLE WARBLER.—In 1918 I identified a Nashville on July 15, in 1919, on June 16 in our clearing in full song. From 1910 to 1915 and in this season (1920) its first appearance was in August, in the warbler flocks that range about each year from July 20 to September 15.

Vermivora peregrina. TENNESSEE WARBLER.—Never identified in this region until July 15, 1918. The following year a Tennessee was in full song in Tree Tops clearing June 15, and seen several times through the following weeks. Adult and immature birds identified later in the season in warbler flocks. Common in migrant flock in August and September 1920.

Compsothlypis americana usneae. NORTHERN PARULA WARBLER.—Records as follows: August 5, 1915; July 1917; June 17, 1918, and often during that following season; June 23, 1919, and often in weeks following. In July saw adult feeding young. This season (1920) I did not see or hear the Parula until July 29, and only a few times later. There is plenty of the *Usnea barbata* in this region, the lichen so favored by the Parula for nesting material.

Dendroica caerulescens caerulescens. BLACK-THROATED BLUE WARBLER.—Common summer resident. Earliest date, June 14. Adult male, adult female and immature well known.

Dendroica coronata. MYRTLE WARBLER.—For this bird I have only one record in late September 1917.

Dendroica magnolia. MAGNOLIA WARBLER.—Common summer resident.

Dendroica pensylvanica. CHESTNUT-SIDED WARBLER.—Common summer resident, often abundant. Nest 1910. Male, female and immature birds are very familiar in this region.

Dendroica fusca. Blackburnian Warbler.—Usual in "Tree Tops" clearing in June and July. Sometimes seen in warbler flocks in August and early September.

Dendroica virens. Black-throated Green Warbler.—Common, often abundant, summer resident.

Seiurus aurocapillus. Oven-bird.—Common summer resident, though varying in abundance. We have found several nests. The flight song or ecstasy song of this bird is one of the delights of our woods. This bird has increased in numbers in the vicinity of our clearing in recent years.

Seiurus noveboracensis noveboracensis. Northern Water-Thrush.—One or two records.

Seiurus motacilla. Louisiana Water-Thrush.—This lovely little habitué of mountain streams is never abundant, but hardly a season has passed without one or two records. Nest in 1910. Nesting location discovered in 1919, but nest not found.

Oporornis agilis. Connecticut Warbler.—Rare. September 21, 1917, pair well seen in "Tree Tops" clearing. August 16, 1919, and several dates following at "Tree Tops" and on the road near Parker Brook.

Oporornis philadelphia. Mourning Warbler.—1910, 1911, a pair feeding young often seen in "Tree Tops" clearing. Not identified at all 1912 to 1917, though we looked for it. Pair seen July 18, 1919, and in 1920, this warbler was seen and heard often at "Tree Tops" in June. I have seen the female several times in August 1920, and have several August records for song in the early morning.

Geothlypis trichas trichas. Maryland Yellow-throat.—Common summer resident throughout the valley.

Wilsonia pusilla pusilla. Wilson's Warbler.—Migrant. Records date from August 18 to September 14, 1912 1917, 1918, 1919, 1920.

Wilsonia canadensis. Canada Warbler.—Usual each year. Earliest record June 28, 1912. More abundant in late July and August. Possibly a migrant during most seasons.

Setophaga ruticilla. Redstart.—Common, often abundant, summer resident. I have found them commonly, contrary to Mr. Bicknell's experience, above an altitude of 3000 feet, even on Slide Mountain.

Dumetella carolinensis. Catbird.—This bird used to be a common summer resident before 1916, when the native people left this part of the valley. It is still here but has become scarce. I have seen and heard them each year, but the number of nesting pairs seems greatly reduced. They are really rare about our "Tree Tops" cabin and eastward toward Slide. This is perhaps another illustration of the effect of change of land culture on bird population.

Toxostoma rufum. Brown Thrasher.—Very rare. One record, exact date lost (C. S. Daley).

Troglodytes aedon aedon. HOUSE WREN.—Usual, though not abundant, summer resident, especially, as is to be expected, near inhabited houses. Several nests found, one in an old shoe hung on a nail in a half-open wood-shed.

Nannus hiemalis hiemalis. WINTER WREN.—Usual, in deep woods back of "Tree Tops" ridge (Valley of the Biscuit Brook); also on Wildcat Mountain and on Slide. This season I have twice seen a single individual of this species in the brush along the roadside in front of our cabin.

Sitta carolinensis carolinensis. WHITE-BREASTED NUTHATCH.—I have but one certain record of this bird in this region in the nesting season (July 6, 1917). This year I have heard it frequently, and seen it once, through July and August. I have frequent records in other years in September, and in deep ravine woods of Fall Brook, August 22, 1919.

Sitta canadensis. RED-BREASTED NUTHATCH.—One record, late September 1917, on the roadside in front of our house.

Penthestes atricapillus atricapillus. CHICKADEE.—Common summer or permanent resident.

Regulus satrapa satrapa. GOLDEN-CROWNED KINGLET.—One record, September 23, 1917.

Regulus calendula calendula. RUBY-CROWNED KINGLET.—September 24, 1917, and often in the week following.

Hylocichla mustelina. WOOD THRUSH.—Heard and seen occasionally 1911, 1913 and 1915. In June, 1918 and 1919, a pair nested in woods back of "Tree Tops." Not common, never abundant.

Hylocichla fuscescens fuscescens. VEERY.—Usual summer resident. In June 1918 a nest was found in the top of an old tree-stump about three feet from the ground with four eggs. Family of young safely hatched and reared. The song of the Veery in these woods is one of the delights of the season.

Hylocichla ustulata swainsoni. OLIVE-BACKED THRUSH.—Common summer resident every year, increasing in numbers in recent years as the valley has become more wild. The notes of the Olive-backed Thrush are in general in the same musical "family" with those of the Veery. He performs a spiral-like set of notes with ascending scale (contrasting with the descending scale of the Veery), ending in a lovely high warbling trill that is missed by many ears.

Hylocichla guttata pallasi. HERMIT THRUSH.—Always usual, now a common summer resident. It is the most dominant bird of our clearing in the last five years. We often hear several Hermits at one time. Their favorite hour for song is, as with most other birds, at dawn and at dusk; but it is not unusual to hear a Hermit at any hour of the day, even at noon. A single bird will sit on some favorite perch and sing for one or two hours at a stretch, especially during the second nesting stage in

late July. Nest found June 1918 with three eggs. Parent on nest watched at a distance for several days, then the nest was found to be empty. In the same nest two cold Hermit Thrush eggs were found two years later (1920).

Planesticus migratorius migratorius. ROBIN.—Common summer resident throughout the valley. Many nests found

Sialia sialis sialis. BLUEBIRD.—In our clearing these birds are only occasional visitants, but in the homestead region west of us they are usual, though never abundant, summer residents.

My list totals 89 species or with the addition of the House Sparrow, 90. These may be grouped as follows:

Migrants seen before June 8 after July 15 only, usually in August or September, 14 species.

Occasional Visitants or rare Summer Residents, 15 species.

Usual Summer Residents, 60 species.

In comparing my observations with those of Mr. Bicknell previously referred to (Transactions Linnaean Society New York, Vol. I–III, 1882–84), it is interesting to note that he mentions in addition to my list for Slide Mountain, the Blackpoll Warbler and the American Crossbill. His report covers a wider Catskill region than I have chosen, even the Hudson Valley near Catskill, N. Y. The birds he mentions, not on any of my records are:

Olive-sided Flycatcher
Screech Owl (Hudson Valley)
Bobolink (Valley pastures)
Red-headed Woodpecker (Hudson Valley)
Cowbird (cites Mr. Burroughs as authority)
Meadowlark (Esopus Fields)
Orchard Oriole (few)
Myrtle Warbler (in June)
Warbling Vireo (Pine Hill and Big Indian)
Wood Duck
Black Duck
Sky Lark (Alauda arvensis) (reported by Burroughs)
Traill's Flycatcher

The birds unrecorded by Mr. Bicknell which I can add to his list for the Catskills are:

Marsh Hawk
Tree Swallow

Golden-winged Warbler
Nashville Warbler
Tennessee Warbler
Connecticut Warbler
Wilson's Warbler
Ruby-crowned Kinglet
White-crowned Sparrow

All of these, except the Nashville and Tennessee Warblers are migrants, therefore would not be found in June, the time of Mr. Bicknell's own observations.

The three most interesting bird events of our experience here are:

(1) The change in dominant bird population since the decrease in human homesteads and cultivation. Where there were about twenty families scattered in homes through the Valley, the predominant birds in and about "Tree Tops" were Song Sparrows, Towhees, Catbirds and Robins. Since the relative desertion of the Valley by the native population, though the "Tree Tops" clearing itself is unchanged, the characteristic birds about our cabin are warblers, Ovenbirds and thrushes.

(2) The thrush chorus at sunset and dusk, and again at dawn. For the last five years we have been treated to a feast of thrush song. It is not unusual to hear several of each kind singing at once—Hermits, Olive-backs, Veeries and often a lone Wood Thrush. All through June and until July 29, we have all four species singing, each with his own incomparable notes. After July 20, the Veeries and Wood Thrush notes are silent; after August 1 the Olive-backs stop, while the Hermits sing until August 15 or 22—based on three years' records.

(3) The mixed flocks of flashing, fascinating, restless warblers, vireos, smaller fly-catchers and chickadees from July 20 till the time of our departure in September. I regret that I am not here during the entire migration season to keep records of all the changes in bird population.

Sleighton Farm; Darling, Delaware Co., Pa.

A COMPARISON OF THE FOOD HABITS OF BRITISH AND AMERICAN STARLINGS.

BY E. R. KALMBACH.

ECONOMIC ornithology has pointed out few if any more regrettable instances of change in the economic relations of a bird than that which occurred and is still transpiring in the case of the Starling in Great Britian. While the earlier research workers in the field of economic ornithology in the British Isles were aware of the potential power for harm in the Starling should it ever become overabundant, they were satisfied, that in normal numbers this bird was one of the most beneficial. Gilmour, Newstead, Theobald, McGowan, and Collinge all recognized the admirable qualities of this bird as a destroyer of terrestrial insect pests and urged its conservation. As long ago as 1913, however, Dr. Walter E. Collinge, the eminent Scottish biologist, sounded a note of warning that the increase of the Starling population was rapidly bringing about a change in the economic status of the bird. At that time he said:[1] "As has long been contended by agriculturalists, numerically this bird has increased enormously during the last ten or twelve years. This increase I believe to be largely due to migration and the protection afforded to wild birds in general. Considerably reduced in number, I believe the Starling would regain the good name it has borne in the past, and prove a most useful bird to the farmer; at present it is far too numerous and a source of considerable loss."

In April, 1919, Dr. Collinge stated further[2] that at that time "the Starling offers a most serious menace to the production of home grown food, and any further increase in its numbers can only be fraught with the most serious consequences." In his latest contribution[3] to this pressing subject the same authority prefaces his remarks by the unequivocal assertion that "for many years past there has been taking place a sure but gradual

[1] The Food of Some British Wild Birds, p. 49. London, 1913.
[2] The Plague of Starlings. National Review, No. 434, pp. 252–257, April, 1919.
[3] The Starling: Is It Injurious to Agriculture? Journal of the Ministry of Agriculture, Vol. XXVII, No. 12, pp. 1114–1121, March, 1921.

change of opinion with reference to the economic status of the Starling, for from one of our most useful wild birds it has become one of the most injurious. Its alarming increase throughout the country threatens our cereal and fruit crops, and the magnitude of the plague is now fully realized."

So emphatic a condemnation of a species by the leading economic ornithologist in Great Britian must necessarily attract the attention of all engaged and interested in the agricultural problems of that country during this period of reconstruction, and it doubtless will result in some aggressive measures being taken to reduce the number of this species to the point where it again may render its efficient aid as a check on insect life without exacting an unfair toll for its services. For the farmers and bird students of this country Dr. Collinge's castigation of the Starling in its native home carries with it much food for thoughtful consideration. A discussion of the recent findings concerning its economic relations abroad compared with the result of investigations in this country, where the Starling has obtained a firm foothold, consequently seems called for. Fortunately, in his recent studies of the food habits of birds, Dr. Collinge has used the volumetric method of stomach analysis, identical with the procedure in vogue for many years in this country and used in the recent study of the food of the Starling in the United States,[1] This permits comparisons in a way that heretofore has been impossible.

In explanation of the great increase of the Starling in Great Britian and the resultant change in its economic status we are told that it is due "*firstly*, to the security of its nesting site; *secondly*, to the change in its food habits; and *thirdly*, to the autumnal immigration." Either one of the latter two phenomena alone might easily result in disaster when an economically important species is involved. "There is fairly reasonable evidence," Dr. Collinge states, "to show that in the past the bulk of the food consisted of insects and insect larvae, slugs, snails, earthworms, millepeds, weed seeds, and wild fruits; in more recent years this has been supplemented by cereals and cultivated fruits and roots."

[1] Economic Value of the Starling in the United States. By E. R. Kalmbach and I. N. Gabrielson. Bulletin 868, U. S. Dept. of Agriculture (Biological Survey), pp. 1–66, pl. 1–4, January 10, 1921.

As a resident of the east coast of Scotland for four years he attests to the countless thousands of migrating Starlings that reach the British Isles from the northeast. Within his comparatively limited field of observation he reported daily the arrival of flocks of 1,000 to 5,000 in September of 1915. "In 1916, the numbers seemed less but they increased again in 1917, and in 1918, they outnumbered anything seen previously. . . . One flock alone contained something between 150,000 and 200,000 birds, and on the 9th of September a still larger flock was seen. This immigration of course occurs all along the eastern coast of England and Scotland, so that the actual number of arrivals must total many millions."

As a basis for determining the economic influences of the Starling in Great Britain, Dr. Collinge had available the stomachs of 368 adult birds secured from various districts and during every month of the year. These were used in an investigation concluded in October, 1918. To compare with his results we have the data from the examination of 2,157 stomachs of adult Starlings collected in the centers of Starling abundance in this country mainly during 1916. A tabular presentation of the food percentages as determined in each of these investigations will permit an easy comparison:

Food Items	Per cent in Great Britain	Per cent in the United States
Animal food	51.00	57.00
Vegetable food	49.00	43.00
Injurious insects	26.50	34.66
Neutral insects	3.50	1.74
Beneficial insects	2.50	4.89
Earthworms	8.50	Negligible
Slugs and snails	6.50	0.94
Millipeds	1.50	11.71
Miscellaneous animal matter	2.00	1.58
Cereals	20.50	1.16
Cultivated roots and leaves	2.50	Negligible
Cultivated fruits	15.50	4.41
Wild fruits and weed seeds	7.00	23.86
Miscellaneous vegetable matter	3.50	13.57

At the outset, the division of the food into its elementary animal

and vegetable portions reveals a significant difference between the British and American Starlings. Nearly half the sustenance of the British birds comes from the vegetable kingdom, while in the food of the American birds a difference of 14 per cent. exists between the two portions. Analysis of the differences in the percentages of the component parts of the food yields startling, and, for us, gratifying, results. In the consumption of injurious insects of various kinds the Starlings of this country surpass the British cousins in a signal manner: of neutral insects they take about half as many: and of beneficial forms they eat 4.89 per cent. as compared with 2.50. This record of a greater consumption of beneficial insects is due largely to the inclusion in this estimate most of the ground beetles (Carabidae) eaten by the American birds. There is no doubt that a great part of these insects, especially members of the genera *Anisodactylus*, *Amara*, and *Agonoderus*, so frequently eaten by Starlings, possess marked vegetarian habits and rightly should be credited as neutral or injurious. The high percentage of earthworms consumed by the British birds is indicative of feeding during rainy spells or in a naturally more humid climate. The American birds subsist to a considerable extent on earthworms during prolonged rainy spells but forsake such food as soon as dry weather keeps these annulates below the surface. Slugs and snails, some of which are pronounced pests in the British Isles, are much less common in areas frequented by the Starling in this country, a situation reflected in the food percentages. In the case of the millipeds eaten, however, an anomalous situation presents itself. These myriapods have been generally recognized as a menace to gardens in Europe, where they at times are very abundant. In the United States, however, their injuroius habits, though recognized, have attracted much less attention—too little perhaps, if their frequency in the Starling's food is a fair index of their abundance. Over a ninth of the Starling's annual food in this country is secured from this source, whereas in Europe the bird takes only about an eighth of this, proportion.

As it is in the consumption of its vegetable food that the Starling's greatest powers for damage lie, it is especially gratifying to learn that in this respect our Starlings show the most marked

difference in food preferences from their relatives abroad. With a less pronounced vegetarian diet to begin with our Starlings present a very commendable record when this portion of their food is subjected to careful analysis. The most bitter complaints to-day against the Starling in England concern its depredations on sprouting grain and these are convincingly substantiated by the percentage of cereals eaten by the birds examined. Over a fifth of their food came from this source, wheat being frequently attacked. In this country, however, the Starling's limited granivorous propensities are satisfied mainly at the expense of ripening corn (maize). Even the percentage of 1.16 given for the American bird conveys an exaggerated idea of the damage it inflicts on growing or ripened grain, as much included under this item was gleaned from chicken yards or was waste grain picked up during the winter months. In its feeding on truck crops there is a possibility that the negligible percentage recorded against our bird does not adequately represent the change that at times occurs. In its consumption of cultivated fruit the American bird again presents a better record, especially when it is realized that about a third of that consumed was secured from frozen apples pecked into during the winter months. As a cherry thief, however, our bird is doubtless as proficient as the British one. The abundance of acceptable wild fruits, wild black cherries, elderberries, sour gum berries, bayberries, and the fruit of sumacs, both poisonous and non-poisonous, is a dominating factor in neutralizing the effect of the Starling's vegetarian diet in this country; and likewise the lack of a supply sufficient to meet avian needs is probably an important reason for the Starling's objectionable vegetarianism in England. There it consumed less than a third the quantity of such food eaten by the Starling in America. The ability (or necessity) of the American bird to make out a living in close proximity to densely populated sections is reflected in its consumption of miscellaneous vegetable food during winter, secured mainly from garbarge dumps. In this activity it has shown marked proficiency.

Thus in five of the more important of the twelve categories into which Dr. Collinge has segregated the food of the British Starlings, namely injurious insects, millipeds, cereals, cultivated roots and

leaves, and cultivated fruits, we find the American bird has a better record. The consumption of five others, neutral insects, earthworms, miscellaneous animal matter, wild fruits and weed seeds, and miscellaneous vegetable matter, may be considered neutral in its aggregate effect. On the basis of the figures presented the American bird has made a less satisfactory record in the consumption of only two items—beneficial insects, of which it eats more; and slugs and snails, of which it takes a very few. Even here the offense becomes less when it is considered that many vegetarian species of carabids were included in the percentage of beneficial insects in the estimates for the American bird, and that in the United States injurious slugs and snails are by no means so abundant or destructive as in England.

A segregation of the percentages of the foregoing tabulation, after the manner employed by Dr. Collinge in this recent precentation of the case of the Starling, will permit a comparison of the aggregate influences for good and harm in the birds of the two countries.

Activities	In Great Britain (Per cent)	In America (Per cent)
Beneficial		
Animal food	34.50	47.31
Neutral.		
Animal food	14.00	3.80
Vegetable food	10.50	38.85
Total	24.50	42.65
Injurious.		
Animal food	2.50	5.89
Vegetable food	38.50	4.15
Total	41.00	10.04

Such strongly contrasting evidence leaves not a shadow of doubt as to the marked economic superiority of the American bird based on a study of food habits at this time The degree to which the American bird is more or less culpable than the British as a destroyer of other birds can not be determined for lack of comparative evidence. A discussion of this phase of the Starling's economic influence in this country will be found in the treatise pre-

viously alluded to in this discussion.[1] The same may be said regarding a discussion of the objectionable nature of the birds' fall roosts.

In addition to recognizing the overwhelming economic superiority of the American bird over his foreign relative, there is no recent evidence materially to change the decision regarding it in this country made in Bulletin 868 of the Department of Agriculture: "Most of the Starling's food habits have been demostrated to be either beneficial to man or of a neutral character. Furthermore, it has been found that the time the bird spends in destroying crops or in molesting other birds is extremely short compared with the endless hours it spends searching for insects or feeding on wild fruits. Nevertheless, no policy would be sound which would give the bird absolute protection and afford no relief to the farmer whose crops are threatened by a local overabundance of the species. Consequently, the enactment of laws that afford protection to the Starling, except when it is actually doing or threatening to inflict damage, appears to be the wisest procedure. With its ready ability to adapt itself to new environments, the Starling possesses almost unlimited capacity for good, but it is potentially harmful in that its gregarious habits may abnormally emphasize some minor habit which would be indulged in at the expense of growing crops. The individual farmer will be well rewarded by allowing a reasonable number of Starlings to conduct their nesting operations on the farm. Later in the season a little vigilance will prevent these easily frightened birds from exacting an unfair toll for services rendered."

U. S. Biological Survey, Washington, D. C.

[1] Bulletin 868, U. S. Dept. of Agriculture (Biological Survey), 1921.

THE FUNCTION OF THE OESOPHAGUS IN THE BITTERN'S BOOMING.

BY JAMES P. CHAPIN.

Plate VI

ON May 4 1921 the American Museum received from West Nyack, N. Y., an adult male American Bittern which immediately aroused our interest, because of the unusual thickening of the skin of its neck. This exhibited a flabby, oedematous condition like that commonly met with in the "brood-spot" on the breast of an incubating bird. The looseness and great width of this skin, thanks to the sparseness of the feathers on the back of the neck, are well shown in Pl. I, Fig. 2, from a photograph of the dead bird. I was at once reminded of the condition I had observed in the male of an African Rail, *Sarothrura elegans*, which seemed beyond a doubt to inflate its oesophagus with air to use it as a resonating organ for its remarkable voice.

Thus we sought to inflate the neck of the Bittern, blowing through a glass tube. By inserting this in the glottis it was a simple matter to expand the air-sacs of the body, especially the abdominal ones, but also a pair just behind and below the wings, and the "cervical" sacs between the clavicles. Yet there was clearly no connection here with any air-sac in the neck proper, and indeed the Hornbills are almost the only birds known to possess such a connection in the pneumatic system. A number of other birds, however, the best type of which is the Marabou Stork (*Leptoptilos*), do have so-called "cervico-cephalic" sacs that extend down the neck from the head, and receive air from the nares, whence it passes through the space beneath the eye-ball.

Our Bittern was tested for such sacs in the neck by blowing strongly into the internal nares. A slight bulging of the sub-ocular region resulted, but this did not extend to any air-cavity in the neck; nor could we obtain any better result by blowing directly into the air-space under the eye through a large hypodermic needle. Cervico-cephalic air-sacs were entirely wanting.

This left only one organ in the neck that might be filled with air: the oesophagus itself. Blowing straight into the gullet it was easy to distend the neck throughout its whole length, until it

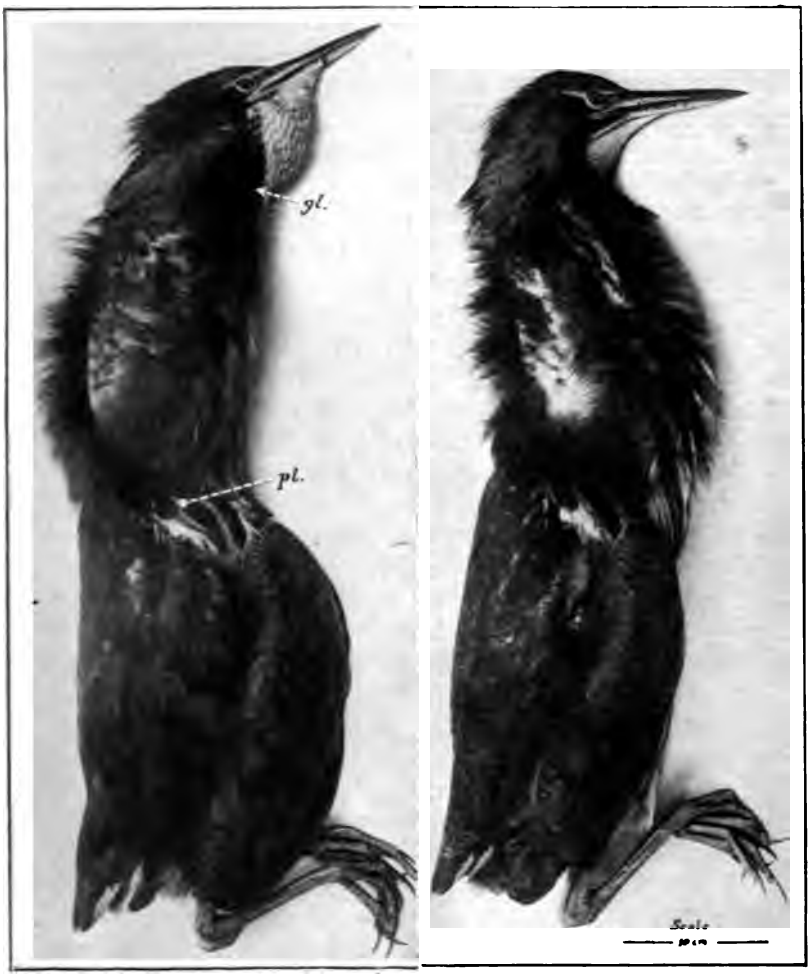


Fig. 1. Adult male American Bittern in breeding season when oesophagus is blown up with air; *gl.* indicates the position of the glottis at this time: *pl.* marks the point where the white plumes are inserted in the skin. Inasmuch as the air-sacs of the body are also expanded, it will be evident that none of them is concerned with elevating the white feathers, here scarcely visible.

Fig. 2. Bittern in the breeding season, to show the width of the neck here completely deflated. (Photos supplied by the American Museum of Natural History).

measured 10 centimeters in diameter; and when the bill was held closed, this air escaped only very slowly, even though no effort was made to close the nostrils. To make the photograph shown in Pl. VI, Fig. 1, it was necessary to place a small rubber band round the bill, and a small piece of damp cotton in the mouth. The glottis seemed unusually free from the hyoid arch or base of the tongue, and lay relatively far back in the throat. When the neck was moderately distended with air, the glottis was situated six centimeters behind the posterior angle of the gape, while the tip of the long slender tongue still reached just to the angle of the gonys, quite well out in the beak.

One unusual feature of this Bittern's mouth still remains to be mentioned. When the tongue came up it passed between or below two curious elongated pads placed on the inside of the mandibular rami, and nearly touching in the center. These we had never noticed before in any member of the Heron family, and it may well be that they have something to do with keeping the air in the gullet, especially since their internal structure resembles that of the thickened skin of the neck, and they are apparently only enlarged temporarily. When the bill is closed these pads lie well in front of the internal nares as may be seen in Figure 2, so they cannot serve to block the nostrils, but rather to close the mouth itself more tightly.

Supposing then that the Bittern does swell its oesophagus with air, how does this proceed? It might conceivably swallow one gulp of air through the action of the tongue and hyoids, but I do not think it could engulf a second mouthful while still retaining the first. As for sucking air into the lower oesophagus, there is no adequate mechanism available. Far more likely I should consider it, that the air is forced into the oesophagus through the trachea, by closing the beak and driving the breath from the air-sacs of the body. The distance to which the glottis can be retracted into the throat renders this more probable.

Thus far my statements may seem highly hypothetical, and I confess that I have never seen a Bittern dilate its neck. I simply believed that it might do so from analogy with other birds like the Pectoral Sandpiper, in which the practice is well known.[1] But fortunately there is an excellent and detailed account, in Brad-

[1] Cf. Nelson, Auk, 1884, pp. 218–221.

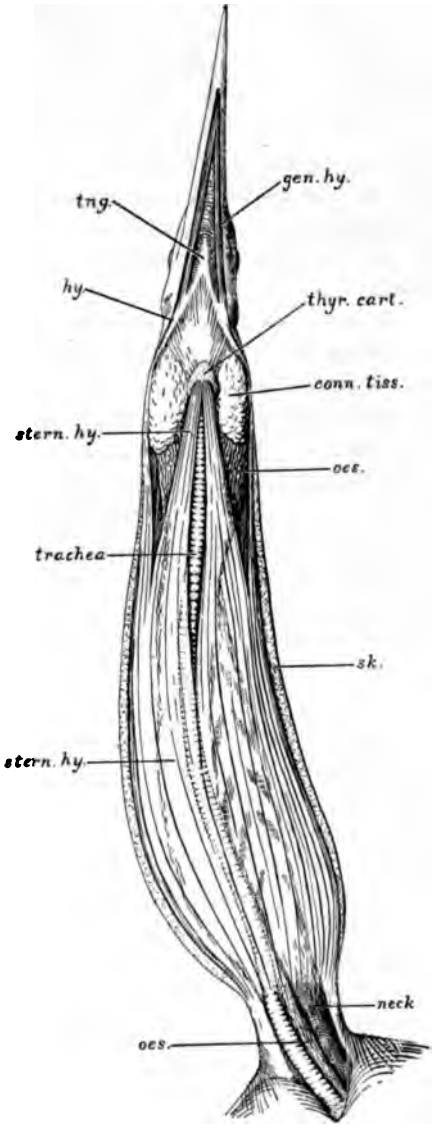


Fig. 1



Fig. 2

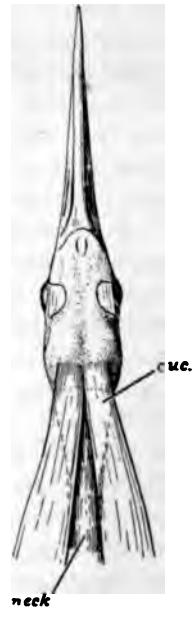


Fig. 3

ford Torrey's 'Everyday Birds' (1901) pp. 69–81, of the actions of several Bitterns as seen during their spring "pumping" in a Massachusetts marsh. On taking up this charming little book, after many years' neglect, I was surprised to find how closely my hypothesis tallied with Torrey's conclusions after watching the live bird. I cannot do better than to quote him directly:

"The Bittern has been standing motionless "

"Suddenly he lowers his head, and instantly raises it again and throws it forward with a quick, convulsive jerk. This movement is attended by an opening and shutting of the bill, which in turn is accompanied by a sound which has been well compared to a violent hiccough. The hiccough—with which, I think, the click of the big mandibles may sometimes be heard—is repeated a few times, each time a little louder than before; and then succeed the real pumping or stake-driving noises.

"These are in sets of three syllables each, of which the first syllable is the longest, and somewhat separated from the others

. . . .

"But the looker-on is likely to quite as much impressed by what he sees as by what he hears. During the whole performance, but especially during the latter part of it, the bird is engaged in the most violent contortions, suggestive of nothing but a patient suffering from uncontrollable nausea. Moreover, as soon as the preliminary hiccoughs begin, the lower throat or breast is seen to be swelling; the dilatation grows larger and larger till the pumping is well under way; and so far as my companion and I could detect, does not subside in the least until the noises have ceased altogether.

Explanation of figures on p. 198.

Fig. 1. Neck of the Bittern, partly dissected, skin removed from lower side, leaving superficial muscles intact. Oesophagus not inflated; *conn. tiss.*, mass of swollen connective tissue at sides of throat; *gen. hy.*, genio-hyoid muscle; *hy.*, hyoid arch; *oes.*, oesophagus; *sk.*, thickened skin, seen in section; *stern. hy.*, sterno-hyoid muscle, ensheathing the neck below. *thyr. cart.*, thyroid cartilage, lying beneath glottis; *tng.*, base of tongue, as seen through floor of mouth. One-third natural size.

Fig. 2. Open mouth of male Bittern in Spring; *int. nrs.*, the opening of the internal nares; *p.*, one of the pads on the inside of the mandible, between which the tongue, *t*, protrudes. (From photo supplied by the American Museum of Natural History.)

Fig. 3. Skinned head of Bittern, from above, showing the occipital portion of the cucullaris muscle, *cuc.*, attached to back of skull. One-third natural size.

"How are the unique, outlandish notes produced? I cannot profess to know. Our opinion was that the bird swallowed air into his gullet, gulping it down with each snap of the beak. To all appearance it was necessary for him to inflate the crop in this way before he could pump, or boom. . . .

"I made some experiments afterwards, by way of imitating the noises, and these experiments, together with the fact that the grand booming seemed to be really nothing more than a development of the preliminary hiccoughs, and the further fact that the swelling of the breast did not go down gradually during the course of the performance, but suddenly at the close,—all these incline me to believe that the notes are mainly if not entirely caused by the inhalation or swallowing of the air . . . "

* * * * * * * * *

The only point on which I cannot agree with Torrey is the "swallowing" of the air, which is mechanically so difficult to explain. I believe rather that it comes from the trachea through the glottis.

To examine further the structure of the accessory vocal organs, since it would seem still as though the sound must originate in the syrinx, I made a thorough examination of the neck and its covering. Rolling up the skin of the neck from below, I found the walls of the oseophagus as thin as usual, and extensible as they always are in a Heron's or Bittern's neck. There was no trace of true air-sacs, all dilation must involve the oesophagus alone. But the skin of the neck, down to a point close to the shoulders, was very much thickened all the way round save for the mid-dorsal line, where it remained as thin as normally. The thickening was due mainly to the bloated condition of the connective tissue forming the deeper layer of this skin, now five millimeters thick over a large part of the neck. Besides an infiltration of lymph, a very rich supply of small blood-vessels was also noticeable in this tissue, which extended from near the base of the neck up to a point close to the back of the skull. Just behind the head, more deeply placed, and close to the horns of the hyoid, there was a loose mass of similar lymphoid tissue on each side of the throat; and as already stated, the elongate pads inside the lower jaws were filled with the same tissue, all of which would undoubtedly subside if not com-

pletely disappear after the breeding season.

On the inside of this heavy skin of the neck, moreover, there was a thin layer of muscle, its fibers running in an antero-posterior direction, and lacking only on the median dorsal line. Posteriorly no attachment to the body was noticed, at most it was slight, and the muscle was closely united with the skin; but anteriorly there were two paired attachments. The upper ones were on the occipital region of the skull, and showed that the greater part of this muscular layer represents the longitudinal layer of the cucullaris muscle, present in very many birds. On the lower side of the neck, two muscular bands presumably representing the sterno-hyoid, inserted anteriorly on the thyroid cartilage, whence other muscular strands continued to the hyoid. (See Figures 1 and 3.)

The contraction of this sheet of dermal muscle would shorten the skin of the neck, and rather than to draw air into the oesophagus it would tend to expell it; so the explanation of the process is not to be found here. What we can say with certainty is that the American Bittern, in producing its well-known "pumping" notes, does distend the oesophagus with air, and that in connection with this habit there is developed in the breeding season a remarkable thickening of the skin of the neck, with perhaps a modification of parts of the lining of the mouth that serve to help in retaining the air. Another adult male Bittern, skinned by our taxidermist about a fortnight earlier, is stated by him to have had the neck in the same condition. Probably only the male birds exhibit these modifications, for they alone are known to pump or boom.

The use of the oesophagus in such a manner is by no means confined to the Bitterns. It is perhaps best known in the case of the Pectoral Sandpiper, though according to Pycraft[1] many of the Pigeons produce their incessant "cooing" in this way; and even the male Ostrich is said to fill his gullet with air, and then produce by its expulsion the loud sound known as "bromming."[2] A somewhat similar action has been observed in the case of an African Bustard, *Neotis cafra denhami*, which utters a loud bark like that of a Bushbuck,[3] yet has no pharyngeal sacs like those of

[1] 'A History of Birds,' 1910, pp. 148, 149.
[2] See Duerden, American Naturalist, LIV, 1920, p. 306.
[3] Forbes, Proc. Zool. Soc. London, 1880, p. 478.

Otis tarda; and an Australian member of the same family, *Eupodotis australis*,—Pycraft tells us— likewise employs its gullet as a vocal sac. Further, the male of an African Rail, *Sarothrura elegans*, which is responsible for a clear, long-drawn note recalling a tuning-fork, and heard usually at night, undoubtedly shares the habit of inflating the oesophagus, and has a thickening of the skin of the neck nearly comparable to that of the American Bittern. This I have examined personally in the Congo.

Finally, there are several passerine birds with patches of bare skin at the sides of the neck, for example the African *Camaroptera superciliaris* and *Bathmedonia rufa*, as well as the South American *Donacobius atricapillus*[1] in which something of the sort appears to take place.

A word may here be appended concerning the display of fluffy white plumes by many male American Bitterns in the mating season, to which attention was called by Mr. William Brewster some years ago.[2] These can be erected conspicuously at the sides of the upper back. The specimen we have been describing possessed such tufts of cream-colored feathers, arising from the anterior part of the pectoral tracts, a little in front of, and lateral to, the fore end of the large powder-downs. Mr. Brewster was not satisfied as to just how these plumes could be raised, though it had been suggested to him that the skin of this region might be inflated; but from what has already been said, it will be clear that no air-space exists beneath them. Instead the mechanism for elevating them was seen to consist of the superficial muscle commonly found at the base of the neck, the cervical portion of the cucullaris, which runs obliquely downward and backward from the mid-dorsal line at this point. Its lower edge, in this case, was found to be inserted in the skin about the bases of these white feathers, which are usually concealed by the dark streaked ones lying just in front. So the contraction of this muscle would suffice to elevate the plumes in exactly the way Mr. Brewster described it. Perhaps also the shortening of the longitudinal muscle strands beneath the skin of the neck would pull that of the base forward, and aid in the process.

American Museum of Natural History, New York, N. Y.

[1] See Fuertes, Bird-Lore, XV, 1913, p. 342.
[2] 'Auk,' 1911, pp. 90–100.

RODERICK ROSS MACFARLANE, 1833–1920.

BY EDWARD A. PREBLE.

Plate VII

RODERICK ROSS MACFARLANE, a Corresponding Fellow of the American Ornithologists' Union since 1885, died in Winnipeg, Manitoba, Canada, on April 14, 1920.

He was born in Stornoway, Island of Lewis, Scotland, November 1, 1833. His early years were passed in his native town where he attended the Parochial school and the Free Church Academy. He also spent nearly three years in the law office of the Procurator Fiscal of the Lewis District.

Related on his father's side to one of the officers of the old Northwest Company, and on his mother's to Sir Alexander Mackenzie, the famous explorer and also a member of the same great fur-trading corporation, it was only natural, when he reached early manhood, that he should cast his fortunes in the New World with the Hudson's Bay Company, at that time holding the exclusive fur-trading privileges over most of Canada, and being all-powerful in its government. He accordingly signed a five year contract as apprentice clerk in the service of this great concern, the oldest incorporated company in the world, and sailed from Stromness, Orkney Islands, on July 3, 1852, in the Company's ship *Prince of Wales* bound for York Factory on Hudson Bay. On August 18, being then under 19 years of age, he landed in the New World, where, with the exception of two brief visits to the land of his birth, he was to spend the remainder of a long and useful life.

His stay at York Factory was brief, and he then proceeded inland to Norway House and Fort Pembina (on Red River near the Manitoba boundary) where he served for a time as clerk and later was in charge of an outpost at Long Lake. In 1853 the Fur Trade Council, composed of the most influential of the officers of the Company, in recognition of the ability of young MacFarlane, appointed him in charge of Fort Rae on the northern shores of Great Slave Lake, and here he passed the next winter. The following summer (1854) he was in charge of Fort Resolution,

and in the autumn was made manager of old Fort Good Hope on the lower Mackenzie. The next winter he took charge of Fort Liard, on Liard River, the main western branch of the Mackenzie, later spent three months at Fort Simpson, the head post of the Mackenzie River District, and then resumed charge of Fort Good Hope where he remained through 1856.

In 1857, still with headquarters at Fort Good Hope, he made an exploratory trip to the lower Anderson River, at that time an absolutely unknown region. This trip, undertaken mainly to open the way to new trade channels but partly, perhaps, in obedience to a yearning for new scenes and adventures, was destined to be an event of considerable importance in the world of ornithology. On this journey, after leaving the valley of the Mackenzie, he descended successively the Lockhart and Anderson Rivers, named by him after brother officers in the Hudson's Bay Company. When within a few miles of the Arctic Ocean a large camp of Eskimo was encountered, the inhabitants of which plundered MacFarlane's small party, and brought his explorations in that direction to an end. Retracing his way on foot up the river, MacFarlane, with characteristic energy, procured a small canoe from an Indian encampment, and explored a part of the upper Anderson, and, reaching the Hareskin River by an overland march, descended it to the Mackenzie. Many years later, he was awarded the Victoria Arctic Medal, mainly in recognition of this exploration.

We have no evidence that up to this time MacFarlane had possessed any particular fondness for natural history, but the latent passion was shortly to be awakened. In the summer of 1859 Robert Kennicott, young and enthusiastic, was sent to the Mackenzie region by Professor Spencer F. Baird of the Smithsonian Institution. Necessarily making his headquarters at the posts of the Hudson's Bay Company, the only civilized settlements, his enthusiasm proved so contagious that his hosts, the fur traders, hitherto interested in the feathered and furred inhabitants only in a commercial or gastronomic way, forthwith became zoological collectors. The names of these men, whose labors of love during the next few years added so materially to the scientific knowledge of northern North America, including only those who worked in the Mackenzie Basin, number at least a score, and of this generous

company MacFarlane made by far the most complete and valuable collections. To the young fur trader, then in his early manhood, endowed with an alert and receptive mind, a splendid physique, and an indomitable energy, the enthusiastic example of Robert Kennicott furnished the inspiration needed to point out a pursuit which occupied his spare time and efforts for several years. His earlier collections were made mainly about Fort Good Hope, but his more important contributions came from Anderson River and the region adjacent. A brief notice of the history of Fort Anderson, a trading post built by him on that river, is necessary to a proper understanding of the situation.

Having secured the sanction of the Hudson's Bay Company MacFarlane began in the summer of 1860 to establish a trading post in the region explored by him in 1857, to trade with the Eskimo of Liverpool Bay and the adjacent Arctic Coast, as well as with the Hare Indians, a part of whose hunting grounds lay to the southward, Men were set to work cutting timber on the banks of the river at the point nearest the proposed site where suitable trees abounded. In June, 1861, the prepared lumber was rafted 80 miles down stream, and the post was built. It consisted of suitable houses and stores, surrounded by a heavy stockade with bastions at the corners, and a gateway dwelling which faced the river. The site was on the right bank of the Anderson, approximately in latitude 68° 35′. (Fig. 1.)

During this season, although his associates and their teacher Kennicott were busily engaged during their spare time at their respective stations in collecting birds and eggs and other objects of natural history, MacFarlane was fully occupied in the construction of his new trading post. It was Kennicott's intention to spend the next season in this new field, but urgent duties in the United States made it necessary for him to leave the north, and it was left to MacFarlane to prosecute the work alone. Accordingly, after the completion of the spring fur trade in 1862, he made the first of a series of overland journeys through the dwarfed timber and across the Barren Grounds to Franklin Bay. On these journeys, necessarily made on foot, he was accompanied by several Indians, and the different members of the party took separate courses, so as to discover as many nests as possible. Rendezvous

Lake, a locality which figures prominently in the biographies of many of the nesting birds of this subarctic region, situated on the border of the Barren Grounds, formed a sort of halfway station, where the various parties met by appointment and from which the accumulated collections were sent back. Continuing northeastward toward the Arctic Ocean, the line of march crossed the Wilmot Horton River, the spruce-clad valley of which was found to be the home of the most northern-venturing individuals of a number of woodland birds. After reaching the coast, MacFarlane and his native companions spent several days studying

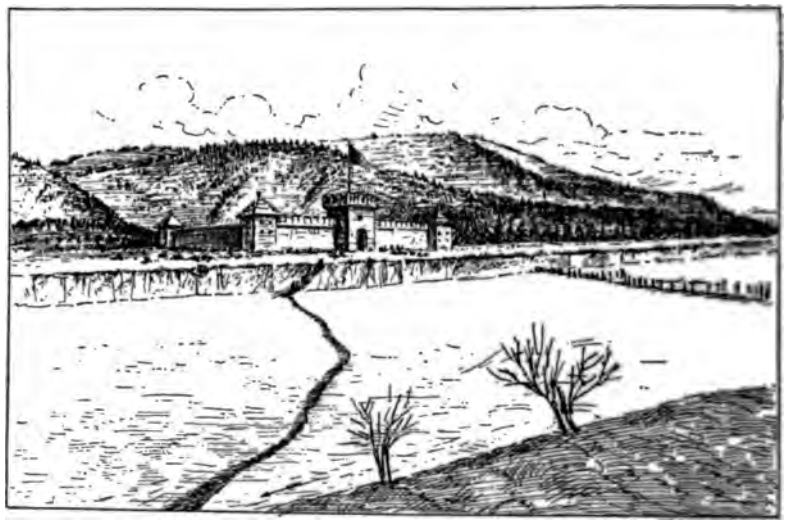
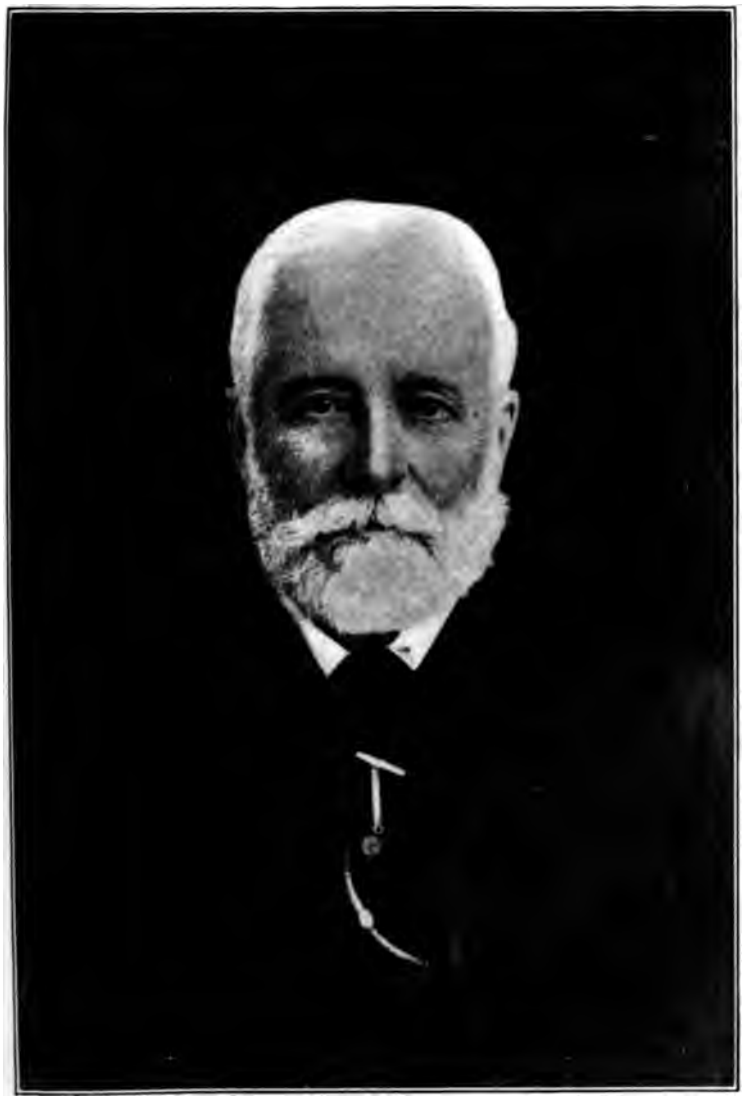


Fig. 1. FORT ANDERSON (from sketch by Emile Petitot, 1865.)

the terns, gulls, and shorebirds of Franklin Bay, after which the brave party, heavily laden with the precious specimens, retraced its way over the weary miles of tundra and mossy fen to the trading post.

In the following summer the journey was repeated on a larger scale. MacFarlane led one party over substantially the former route, while others followed parallel courses to the north and south, all assembling at Rendezvous Lake. Franklin Bay was again their objective, and was more thoroughly worked, a large island



RODERICK ROSS MACFARLANE.

some distance off shore being included in the survey. Other similar trips were made in the same region in 1864 and 1865, and the work doubtless would have been continued for several years longer but for a very serious epidemic of scarlatina which ravaged the country in the winter of 1865–66, and resulted in the death of so many native hunters, both Indians and Eskimo, that further continuation of the remote post was considered unprofitable. It was therefore definitely abandoned in 1866.

As before intimated, MacFarlane's labors resulted in many important discoveries. The eggs and nesting habits of many birds, particularly waders, including Baird's Sandpiper. Buff-breasted Sandpiper, Sanderling, Red Phalarope, and Eskimo Curlew, were first made known to naturalists, and many unknown plumages were obtained. Considering the circumstances under which these collections and obervations were made, their number and general excellence were marvelous. Let us picture those little companies of natives under the leadership of their indomitable chief, toiling through the trackless wilderness, carrying on their backs not only their camping equipment and bedding but the collections made from day to day, climbing hills, wading swamps, fording rivers, through sun, and rain, and fog, assailed by countless hordes of insect pests, and hunting their food on the way. Shall one criticize the bird skins if they are not all models of excellence, or some of the eggs because they are emptied through a larger hole than is recommended in the manuals?

MacFarlane's catalogs of his collection made during these years, beautifully written by his own hand, and now preserved in the United States National Museum, bear the data of upwards of 5,000 specimens, mainly ornithological, but including also a large number of mammals, sent by him to the Smithsonian Institution. It should be stated in this connection that in many hundreds of cases a specimen meant to MacFarlane the nest and eggs, together with the parent taken for identification. In addition his contributions to the field of ethnology were numerous and of inestimable value.

After his forced abandonment of the fruitful field in the Anderson region, MacFarlane seems temporarily to have lost interest in natural history. Perhaps he was discouraged by the untimely

death of his close friend Kennicott, whose memory he held in reverence during the remainder of his life; perhaps the fields in which he now found himself seemed unworthy of exploitation after his experiences in the virgin Anderson wilderness. Whatever the cause, we know of no collection being formed by him for a period of nearly fifteen years. From 1866 to 1870 he was stationed mainly at Fort Simpson. In the spring and early summer of the latter year he obtained leave of absence to visit his old home in Scotland. On his return in July, 1870 (the territory so long held and governed by the Hudson's Bay Company having been in the interval transferred to the Dominion Government), he was appointed to take charge of the Athabaska District, and held this charge until 1885. During this period several small collections of birds and eggs were made by him and his associates about Great Slave Lake and Athabaska Lake, mainly in 1880 and 1885. The bulk of these specimens was sent to John J. Dalgleish, of Scotland, with whom, doubtless, MacFarlane had become acquainted during his visit to his old home. A portion went to Dr. Robert Bell, then Director of the Canadian Geological Survey, who was forming the nucleus of the Government collection now housed in the Victoria Memorial Museum, at Ottawa.

During the latter part of his incumbency as head of the Athabaska District he was instrumental in introducing steam on the lower Athabaska and the Mackenzie, thereby displacing the old method of transportation by means of scows and York boats, propelled entirely by man power. About the same time the continuation of the Canadian Pacific Railway westward made it possible to utilize more fully the section of the Athabaska then little known above the mouth of the Clearwater. MacFarlane's exploration demonstrated its superiority, under the new conditions, over the time-honored route by way of the Methye Portage, which had been followed for practically a hundred years, and this new route has since been in use until the last year or two, when the construction of a new branch railroad from Edmonton to the head of steamboat navigation at the mouth of the Clearwater has caused the abandonment, probably forever, of this stretch of difficult water.

In 1886 MacFarlane was granted a year's leave of absence, and

made a second and longer visit, his last, to the old country. On his return he was transferred to New Caledonia District, in British Columbia, with headquarters at Fort St. James, Stuart Lake, where he remained until 1889. Here he made a small but varied collection which was forwarded to the U. S. National Museum. This collection, as far as we know, was the first made in central British Columbia, and naturally constituted a valuable addition to our knowledge of this remote section.

From 1889 to 1893, MacFarlane was in charge of Cumberland District, being stationed at Cumberland House on the lower Saskatchewan. Here he made a considerable collection of birds and eggs, as well as mammals, which was augmented by the labors of several of his associates stationed at outlying posts. This collection, which contained many rarities, was also forwarded to Washington.

MacFarlane published only a few articles, but his papers were all important. In 1890, in the 'Canadian Record of Science,' appeared an account of his first trip to the Anderson. During the same year he published 'Land and Sea Birds Nesting Within the Arctic Circle in the Mackenzie River District.' This was reprinted, with additions and corrections, the year following, in the 'Proceedings of the U. S. National Museum,' under the title: 'Notes on and List of Birds Collected in Arctic America, 1861–1866.' This paper treats about 131 species. A report of similar scope on mammals appeared in the 'Proceedings of the U. S. National Museum' in 1905. His last important paper on birds was published in 1908 as an appendix to a book by Charles Mair, 'Through the Mackenzie Basin,' and was entitled 'List of Birds and Eggs Observed and Collected in the Northwest Territories between 1880 and 1894.' This includes some account of of his Stuart Lake and Cumberland House collections.

MacFarlane married in 1870 a daughter of Alexander Christie, Jr., an officer of the Hudson's Bay Company, by whom he had eight children, five girls and three boys. The youngest boy died when a child; the others attaining positions of honor and trust in law and finance. Several of his daughters were married to men of prominence. He was survived by most of the members of his large family.

MacFarlane retired from the service of the Hudson's Bay Company in 1894, and spent practically all the remainder of his life in Winnipeg, Manitoba. Fur traders have seldom engaged in any regular and definite occupation after retirement, and MacFarlane was no exception to the rule. He retained his interest in the affairs of the Dominion and the world generally, however, and read eagerly and widely. Always interested in the natural history work of others, especially in expeditions to the scenes of his early labors, he was ready to assist in any way to further such plans. He remained active until a short time before his death, retaining in his old age, to a remarkable degree, that keenness of mind and vigor of body which had enabled him to accomplish so much, both as a fur trader and traveler, and as a zoological collector.

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ADVENTURES IN BIRD-BANDING IN 1921.

BY S. PRENTISS BALDWIN

BIRD-BANDING seems, at last, to be coming into its own, since its recognition by the U. S. Biological Survey, and the widespread publicity given to this method of bird study during the last two years. During 1921, three hundred lovers of birds in all parts of the United States and Canada have taken out permits to begin this work; and within the month an additional three hundred or more, from Canada and New England alone, have gathered in Boston to organize the New England Bird-banding Association. The purpose of this organization is to cooperate with the Survey in establishing lines of trapping stations in New England, and by occasional meetings to compare notes and promote bird-banding.

It is because there are so many who are taking up the work anew that the writer will not attempt in this paper to compile scientific data bearing upon one or another phase of bird life, but will instead try to suggest, and illustrate by the data, different methods that may be employed in obtaining the facts.

The bird-bander will save much time, by first reading not only the History and Purpose of Bird banding, by Mr. Frederick C.

Lincoln (Auk, April 1921, Page 217) but by reading also the papers therein referred to. This means not only to study the papers published in the last two years, but to go back to 'The Auk' of 1909 and 1910, and learn that Dr. Leon J. Cole then suggested many of the facts which are only now being proved by these methods.

After seven years of very active bird banding the writer more and more appreciates the foundations laid for bird banding by Dr. Cole, Mr. P. A. Taverner, and Dr. Paul Bartsch, and the years of patient work by Mr. Howard H. Cleaves. The fact is that one does not know what to look for, or what small items may be overlooked and omitted from the notes, items which may be of greatest value. The writer's early notes lack much in value through failure to record certain facts; and years of trapping of House Wrens seem almost wasted because of not knowing until this year how to distinguish the sex of the living birds at a few feet distance.

The bird bander will soon see that two distinct purposes are accomplished in his work. The one is a national purpose, primarily the study of migration of birds, in which each bird bander contributes only his proportionate part to a great mass of information which will accumulate in Washington, and the result be obtained by the co-ordination of the work of all observers. The other purpose is the gathering of most interesting local and domestic details of the daily lives of the birds; matter which cannot be handled from Washington, but which must be worked up for the scientific world by the bird bander himself. No one who takes up this work need feel that by filing his data with the Biological Survey, he is to lose any of the value of it for his own purposes, or for publication over his own name.

Since the question is still sometimes asked, whether bird banding methods are cruel or harmful to the birds it is best to explain that every banding station becomes in fact a bird sanctuary, where food and shelter may be obtained, as well as safety from natural enemies. After seven years of bird banding by the writer on his farm near Cleveland, a prominent ornithologist, upon visiting the farm, said that these few acres had more birds per acre than any place he had ever seen.

So few have been the serious accidents to birds in my traps, or in handling of thousands of birds each year, that I can remember every fatality that has occurred in the seven years experience; such accidents have not averaged two in a year; less than one accident to the thousand birds handled. One of the joys in this work is that the ornithologist may handle for scientific study great numbers of birds in live healthy condition, in normal colors, not affected by the changes which take place so quickly after death, and study normal measurements, and natural attitudes, and individual characteristics, and all without destruction of life. And against my, possible, dozen accidents may be credited the saving of hundreds, yes, actually hundreds of lives of birds on my farm by my care of them.

One form of slight injury does occur with some species of birds in certain forms of traps; and the bird bander may expect it, and not be distrubed about it. Birds remaining in the trap for a time and repeatedly pushing the head through the wires, often scratch the base of the bill; sometimes so severely as to give the head a bloody appearance This injury is more apparent than real, and when the bird is taken again in a day or two the head is quite healed. I have never known one of my birds to suffer weakness or death from this cause. This form of injury can be prevented by making the trap with wire netting of much smaller mesh; or on the goverment sparrow trap use a band of copper mosquito mesh netting around the back of the trap: a band four inches high about the back of the trap will mostly prevent the birds pushing their heads through.

In looking over the following pages in which the adventures of one bird bander in one season are chronicled, bear in mind that the writer is a business man, who can give only part of his time to this avocation; and may we hope that from now on several hundred bird banders will each be securing during each season, much more information than the writer has been able to gather.

BANDING AT THOMASVILLE, GEORGIA, DURING FEBRUARY AND MARCH, 1921.

PERCENTAGE OF RETURNS:

It is necessary to state the number of birds banded in previous seasons, as that, of course, determines the possibilities of returns

in this season, and in the table a wide gap will be noticed, caused by the writer's absence from Thomasville in the two seasons 1918 and 1919. This explains the fact that very few "returns" were taken this year from the years previous to 1920.

Previously Banded:					
1915	Resident birds	27	Migrants	63	Total 90
1916	" "	44	"	169	" 213
1917	" "	24	"	215	" 239
1918	" "	0	"	0	" 0
1919	" "	0	"	0	" 0
1920	" "	51	"	232	" 283
		146		679	825

Some idea of the returns to be expected may be shown by the following figures:

Of the 90 birds banded in 1915, 17 birds, or 19 per cent., have been taken in subsequent years.

Of the 213 birds banded in 1916, 31 birds, or 15 per cent., have been taken in subsequent years.

Of the 239 birds banded in 1917, 12 birds, or 5 per cent., have been taken in subsequent years.

This decreasing percentage of birds re-taken is due to the break in the trapping during 1918 to 1919; but the high rate of returns will be seen in the taking of so many of the 1917 birds even after so long an absence.

In 1921 there were taken 20 birds, or 7 per cent., of those banded in 1920; 5 birds from 1917, and 3 birds from so long ago as 1916.

In 1921 in six weeks of February and March, 1040 birds were handled, 347 new birds, 28 from previous years, and 665 "repeats" meaning by that recaptures of birds already handled one or more times during the season.

It is surprising how constant this last number is, year after year, two-thirds of all birds caught being birds that have been in the traps before.

Of the 28 birds taken from previous years 14 were residents, from the possible 146 previously banded; 14 were migrants, from the possible 679 previously banded; considering the long travel, and many risks of migrant birds through the year, as well as the

possibility of their not returning to exactly the same spot for the winter, we may be surprised not that the proportion of permanent residents retaken is greater, but that so many migrants are taken.

This designation of certain species as residents must be taken only as a convenient classification, but as no trapping is done here at other times of the year there is no proof that these individuals do actually remain here all the year.

RECORDS OF SOME SUPPOSED RESIDENT BIRDS:

Among these "resident" records a few, especially the records of the Blue Jays, begin to give some idea of how long birds may live, under natural conditions.

No. 1916. Blue Jay (*Cyanocitta cristata cristata*)
1916. Banded March 28 at Station A
1920. Taken February 15 at Station A
1921. Taken March 6 at Station AA

As this bird was at least one year old when banded, it is now at least six years old, and each year is taken at exactly the same spot, Station AA, being just on the other side of the house from A.

No. 3177 (*). Blue Jay (*Cyanocitta cristata cristata*)
1916. Banded in March
1921. Taken March 26 at Station C

Another bird that is now at least six years old. This bird is either 31775 or 31777, the last figure is completely worn away, being on the under side of the tarsus, and this bird evidently has an unusual habit of squatting as it feeds on the ground.

No. 31772 was taken in 1920 and the last figure was then quite distinct, so this is not likely 31772.

No. 1929. Blue Jay (*Cyanocitta cristata cristata*)
1917. Banded February 17 and taken also March 11 at A, March. 14 at A, and March. 16 at A.
1921. In January found dead near Station D, about 300 yards from where it was banded in 1917.

This bird was at least five years old.

No. 41897. Blue Jay (*Cyanocitta cristata cristata*)
1917. Banded March 12 at Station B.
1920. Taken February 27 at Station C, and March 3 at Station A.
1921. Taken March 11 at Station A.

These stations A, B and C are within 200 yards of each other, so the appearance at these different stations does not imply much wandering. This bird is another which is at least five years old.

No. 53075. Blue Jay (*Cyanocitta cristata cristata*)
1920. Banded February 16 at Station AA.
1921. Taken March 28 at Station D.

Very few bands on birds I have retaken have shown much wear, but on this band the figure 7 is worn so that it looks like a figure 1.

No. 53080. Blue Jay (*Cyanocitta cristata cristata*)
1920. Banded February 16 at Station AA and taken also March 2 at C, March 8 at AA, March 23 at A.
1921. Taken March 30 at AA.

No. 53092. Brown Thrasher (*Toxostoma rufum*)
1920. Banded February 29 at Station B and taken March 21 at B with 40796.
1921. Taken March 29 at B.

No. 53093. Brown Thrasher (*Toxostoma rufum*)
1920. Banded March 10 at Station A, and taken March 14 at A.
1921. Taken February 23 at A and March 17 at A.

No. 19247. Among the residents I missed this famous Brown Thrasher of so much history since 1915 and I fear the bird has died. (See 'Auk,' April 1921, page 234.)

No. 53086. Mocking Bird (*Mimus polyglottos polyglottos*)
1920. Banded Feb. 19 at Station D and taken Feb. 28 at D, March 1 at D, March 7 at D, March 8 at D, March 10 at D twice, March 11 at D.
1921. Taken Feb. 22 at D.

This bird evidently lives near Station D, the last of the line of traps, and about 300 yards from A.

No. 53069. Red Bellied Woodpecker (*Centurus carolinus*)
1920. Banded February 15 at Station B.
1921. Taken February 25 at A and March 3 at A.

No. 41898. Cardinal, female, (*Cardinalis cardinalis cardinalis*)
1917. Banded March 12 at Station B.
1921. Taken March 28 at Station D.

A bird at least five years old. This is the oldest Cardinal in my records.

No. 53077. Cardinal, male, (*Cardinalis cardinalis cardinalis*)
1920. Banded Feb. 16 at Station A.
1921. Taken March 22 at Station D; the band was pinched tight on the leg; it was loosened and fixed so that he can not bend it again.

No. 53089. Cardinal, male, (*Cardinalis cardinalis cardinalis*)
1920. Banded February 20 at Station C and taken 2 at C.
1921. Taken March 23 at D, band pinched tight, and loosened.

No. 53094. Cardinal, male, (*Cardinalis cardinalis cardinalis*)

1920. Banded March 13 at Station A, and taken March 22 at C.

1921. Taken March 19 at Station C, band pinched tight, but leg not injured, so I replaced the band.

MIGRANTS:

Among the migrants, the White-throated Sparrows make up the most interesting group, and I have long ago decided that this is a definite neighborhood group, coming here each winter, since I first found them in 1915, always at Station A, which is, in fact, under my bed room window, in the shrubs about the base of the house. I have not in any year failed to take one or more birds of this group, from previous years, and this year one good old friend appeared to tie up with the past.

No. 38160. White-throated Sparrow (*Zonotrichia albicollis*)

1916. Banded March 5 at Station A, taken March 6 at A, March 7 A, March 16 at A.

1917. Taken March 7 at A, March 19 at A.

1920. Taken February 25 at A, Feb. 27 at A, March 2 at A, Mar. 3 at A, Mar. 6 at A, Mar. 22 at A.

1921. Taken March 17 at A, Mar. 23 at A, Mar. 25 at A, Mar. 27 at A.

This bird is now at least six years old, and has made five trips to Canada and return since being banded; or if not to Canada, at least to northern New York or New England. ('Auk,' April 1921, page 236.)

No. 45405. White-throated Sparrow (*Zonotrichia albicollis*)

1920. Banded February 19 at Station A, taken March 7 at A.

1921. Taken March 25 at A, Mar. 26 at A and Mar. 28 at A.

A sad accident happened to this bird; on March 26, his left foot was broken, snapped apparently in the trap in a rush into a corner with six others; I did not know how to mend it and decided to cut it off; when taken again, on March 28, the bird seemed as lively and healthy as ever. This is one of the, perhaps, half dozen accidents that have occurred to my birds in as many years, and in handling many thousands.

I had an interesting experience this season in trying to get these White-throats at Station A. The trap was placed in an open rose bed about fifty feet from my window, and day after day the White-throats would

gather about the trap but would not go in; it seemed I could not get them, and I must have them in order to connect this year's group with other years; after two weeks of this I wrote, in a hurry, for some nets, and placed one net just where this trap had been; placing the trap among the shrubs close under my window. To my surprise the White-throats began to go freely into the trap in its new location, only fifty feet distant but in more dense shrubbery, so that I banded many of them. This slight change of location made all the difference.

Among migrants the Myrtle Warblers are interesting as they, like the White-throated Sparrows, go nearly or quite to Canada for the summer.

No. 27290. Myrtle Warbler (*Dendroica coronata*)
1917. Banded February 28 at Station C.
1920. Taken March 7 at Station C, and March 11 at D.
1921. Taken March 1 at Station D, and March 3 at Station B, and March 17 at C.

This little bird is now at least five years old and has made four trips to the north and return since receiving its band.

No. 45433. Myrtle Warbler (*Dendroica coronata*)
1920. Banded March 8 at Station AA, taken March 9 at AA, Mar. 10 at AA, Mar. 12 at AA and Mar. 15 at A.
1921. Taken February 21 at A, Feb. 23 at AA, Feb. 24 at C, Feb. 26 at AA.

No. 45478. Myrtle Warbler (*Dendroica coronata*)
1920. Banded March 12 at D, Mar. 14 at A, Mar. 18 at C.
1921. Taken February 22 at B, Feb. 23 at B and C, Feb. 24 at C twice, Feb. 25 at D and C, Feb. 26 at C, Feb. 27 at C, Feb. 28 at AA and B, March 1 at C twice, Mar. 2 at C and B, Mar. 3 at C and D, Mar. 4 at C, Mar. 5 at C.

No. 45493. Myrtle Warbler (*Dendroica coronata*)
1920. Banded March 13 at B.
1921. Taken February 21 at C, Feb. 25 at D.

Both Myrtle Warblers and Chipping Sparrows easily form the trap habit, and feed at or in the traps most of the time; I have even had them leave my hand and go straight to the next trap and into it, by the time I reached it in making my rounds.

Last year, after my absence, and having taken two Myrtle Warblers of 1917, I was much disappointed not to get even one of the 266 Chipping Sparrows banded in 1915 to 1917. But this year one did return to me, a four year bird.

No. 38839. Chipping Sparrow (*Spizella passerina passerina*)
1917. Banded March 26 at Station C, taken Mar. 27 at D.
1921. Taken March 24 at AA station.

This bird now five years old, winters farther south and comes up through here in March en route to the north.

No. 45448. Chipping Sparrow (*Spizella passerina passerina*)
1920. Banded March 10 at Station D, taken March 14 at B, Mar. 16 at C, Mar. 20 at B, Mar. 24 at B.
1921. Taken February 28 at C, March 11 at C, Mar. 23 at D, Mar. 28 at D, Mar. 30 at D; claw off middle toe left foot and claw off middle and hind toe right foot.

No. 45484. Chipping Sparrow (*Spizella passerina passerina*)
1920. Banded March 13 at Station A, taken Mar. 24 at C.
1921. Taken March 27 at Station C, Mar. 28 at C.

No. 45822. Chipping Sparrow (*Spizella passerina passerina*)
1920. Banded March 14 at B station, taken Mar. 17 at A.
1921. Taken February 26 at A, March 1 at C, Mar. 2 at B, Mar. 3 at D and AA, Mar. 4 at AA, Mar. 7 at B, right foot, diseased; Mar. 8 at C, Mar. 10 at C and A, Mar. 11 at C, Mar. 12 at B, Mar. 14 at AA.

No. 45876. Chipping Sparrow (*Spizella passerina passerina*)
1920. Banded March 19 at Station C.
1921. Taken March 19 at Station C.

No. 45881. Chipping Sparrow (*Spizella passerina passerina*)
1920. Banded March 20 at Station C, taken March 21 at B, Mar. 23 at C, Mar. 24 at D and B.
1921. Taken March 15 at Station C.

No. 45887. Chipping Sparrow (*Spizella passerina passerina*)
1920. Banded March 20 at D, taken Mar. 22 at D.
1921. Taken March 1 at D, Mar. 3 at C, Mar. 4 at C, Mar. 6 at D and B, Mar. 7 at C and B, Mar. 10 at B, Mar. 12 at C, Mar. 13 at D, Mar. 14 at B.

No. 45924. Chipping Sparrow (*Spizella passerina passerina*)
1920. Banded March 23 at AA, taken Mar. 24 at AA, and marked "one claw gone from right foot." Squealer.
1921. Taken March 3 at B and D, 25 at D. The

fact that I had recorded "all claws good" at the time of the 1921 capture and that Mr. L. R. Talbot who is acting for me this year has again caught the bird and finds the claws missing as in 1920, shows how easily one may err in observation.

DISEASED FEET OF CHIPPING SPARROWS:

About the same number, nearly ten per cent., of Chipping Sparrows were found this year with diseased claws. And this again illustrates the need of the observer making careful note of every unusual condition, for after several years I find myself making no progress in the real story of these diseased claws; it is now evident that by making careful note of the condition of each toe, on a diseased bird, every time it is taken, it will soon be possible to know something of how rapidly the disease changes or spreads, and to what degree the claws recover.

EYE COLOR OF TOWHEE:

This season for the first time I have observed carefully the eye color of the Towhees handled, and find all shades from very pale yellow, orange, to orange red and deep red. I had supposed these Towhees to be of the subspecies "*alleni.*" I offer no explanation of the many shades of eye color as others are much better qualified to explain it.

The season of migration was very early, as was also the vegetation. The Myrtle Warblers were abundant in February but had nearly all gone, northward I suppose, by March first; while great numbers of Chipping Sparrows arrived by March first, a week or more ahead of the time they usually appear.

BIRD BANDING AT CLEVELAND, 1921

The season of banding at the farm near Cleveland was really divided into two parts; the nesting season from May 7 to August 7; and the fall migration from September 7 to October 31.

During the nesting season, the birds nesting nearby come frequently into the traps, and bring their young as soon as they are out of the nest; the traps are very closely watched at this time so not to keep setting birds from their nests.

Of the 275 new birds banded 83 were House Wrens, old or young, taken in the nest boxes.

Then during September and October 230 new birds were banded from traps, mostly Sparrows—Song, White-throated and White-crowned, and Juncos. The following "returns" were taken:

No. 53034. Catbird: (*Dumetella carolinensis*)
1919. Banded May 15 at Station B.
1921. Taken May 19 at A with 53913, June 9 at A, 16 at AB.

No. 53913. Catbird (*Dumetella carolinensis*)
1920. Banded June 4 at Station A, taken August 1st at C, with young 53931, taken August 2 at B.
1921. Taken May 15 at B with 52319.
May 18 with 53034 at A (53034 a 1919 bird). Did one of these become the mate of 53913?

No. 29465. Catbird (*Dumetella carolinensis*)
1920. Banded June 22 at Station B.
1921. Taken May 15 at A with 52322 and 52323 Sept. 24 at B.

No. 53925. Thrasher (*Toxostoma rufum*)
1920. Banded July 4 at Station B, taken July 5 at A.
1921. Taken May 15 at Station B.

No. 38461. Chimney Swift: (*Chaetura pelagica*)
1916. June 6 down north chimney
1917. June 12 " " "
1921. June 9 " " " with 21214.
Sept. 8 down south chimney.
21214 no doubt a mate, as both birds were adults and the north chimney contained one nest with 5 eggs and a banded bird setting, no doubt one of this pair. (Proceedings Linnaean Society, N. Y., 1919, page 53.)

No. 45947. Bluebird, male (*Sialia sialis sialis*)
1920. Banded June 7, mate of 45934 on lawn.
1921. June 2, Mate in Box 56, female, new, received band number 48791; three young 48792 to 48794.

No. 45941. Bluebird, female (*Sialia sialis sialis*)
1920. Banded June 6, mate of 45942 in orchard.
1921. July 7 Mate in Box 13, male, new, received band number 21287, two young 21284 and 21285.

No. 45348. Song Sparrow (*Melospiza melodia melodia*)
1919. Banded July 3 at B, marked "young," July 11 at B.
1921. Taken May 17 at A-B.

No. 46044. Song Sparrow (*Melospiza melodia melodia*)
1920. Banded July 25 at B, taken Aug. 6 at A, Oct. 2 at E.
1921. Taken May 14 at A with 48763 adult, possibly mate; May 17 at A, June 4 at A, June 5 at A, June 12 at A, June 16 at A, with 21226 young, and 21233 adult; June 19 with 21261 young, and June 19 at A with 21226 young; and June 20 at A with 21229, young.

It is probable that these young birds are the brood of 46044 and is 21233 the other parent? Perhaps we may know, if they appear together in the trap next year.

No. 46731. Song Sparrow (*Melospiza melodia melodia*)
1920. Banded Sept. 18 at Station B.
1921. Taken June 4 at B.

No. 46047. Song Sparrow (*Melospiza melodia melodia*)
1920. Banded July 25 Station B, Aug. 2 at B.
1921. Taken June 15 at A B.

No. 45989. Song Sparrow (*Melospiza melodia melodia*)
1920. Banded July 5 at B, taken June 14 at B.
1921. Taken July 7, band tight on the leg, changed band to 21282, leg not injured.

No. 46829. Chipping Sparrow (*Spizella passerina passerina*)
1920. Banded Oct. 14 at D.
1921. Taken July 31 at A B.

Still bearing in mind the purpose of this paper, to suggest to bird banders ways in which this method may be useful in the study of the domestic life of the birds, the following incidents may be interesting.

RATE OF GAIN IN WEIGHT OF YOUNG BIRDS:

Robin (*Planesticus migratorius migratorius*)

In a nest on my porch two young birds were hatched May 28, 1921, and a third hatched on May 29. This young bird, being a day late, was smaller than the first two, and it seemed of interest to weigh the three birds and note rate of gain; as one might expect the larger ones to grab all the food and the little one to waste away. They were given bands and the weighing began on May 30 when No. 55246 and 55247 were two days hatched, and No. 55248 only one day hatched.

	Weight in Grams			Daily Increase in Weight		
	No. 55246	No. 55247	No. 55248	55246	55247	55248
May 30.....	261	271	129			
" 31.....	373	388	147	112	117	18
June 1.....	520	520	246	147	132	99
" 2.....	676	644	393	156	124	147
" 3.....	726	698	465	50	54	72
" 4.....	793	730	579	67	32	114
" 5.....	835	761	711	42	31	132
" 6.....	848	783	778	13	22	67
" 7.....	827	793	805	—20	10	27

The birds were not weighed after June 7 because they were then ready to hop off the nest, having developed the sense of fear; though, being no longer disturbed, they remained in the nest until June 10 when the three came off the nest the same day.

It will be seen that the two larger birds gained rapidly during the first five days, then when the feathers began rapid growth the daily gain of weight was much less. The smaller bird made increasing gains in weight until, two days later than the larger birds, it began making feathers rapidly, but by that time it had about caught up in weight. When they all came off nest on June 10 no great difference in feathering could be noticed at the distance of about 20 feet.

MALNOURISHED CHILDREN AND HOUSE WRENS:

One of the writer's hobbies happens to be a charity, establishing nutrition clinics for the correction of malnourishment in children. It is not necessary to dwell upon the subject here except to say that among all children, all over the country, practically one-third are found to be malnourished; and these grow up to be the weak, inefficient adults, as found in the army tests during the war; and as are found in various industries. This is not due to poverty nor to lack of food, but nearly always to other causes, physical defects, poisoning tonsils, bad health habits, home conditions, or many other reasons.

I explain this because I weighed and photographed each day the fine healthy brood of House Wrens in Box 59. Then in Box 53 a pair of Wrens (21264 and 21234) lost by accident all their





PHOTOGRAPHS FROM S. PRENTISS BALDWIN.

HANDLING A BIRD IN BANDING.

brood, except one young bird, and here I thought I could see how fast a youngster can grow with the entire attention of his two parents. Imagine my surprise to find that day by day this bird was one third behind the average weight of the brood in Box 59 for the corresponding day; he was in fact malnourished, and just as we find among children, it was not lack of food; in this case it was *lice* and after a dose of poultry lice killer on the 12th day, he made some gain. Compare the weights in grains as follows:

Day from Hatching	Healthy Bird		Malnourished Bird	
	Weight	Gain	Weight	Gain
2	30	..	..	..
3	41	11	..	..
4	67	26	55	..
5	89	22	77	22
6	108	19	72	5 (loss)
7	120	12	83	11
11	159	39	100	17
12	161[1]	2	103	3
13	161	0	114	11
14	..[2]	..	125	9
15	..	..	120[3]	5 (loss)
16	flew		124	4
17	flew		flew[4]	

EXPLANATION OF PLATES

From Photographs furnished by S. Prentiss Baldwin.

Plate VIII, FIG. 1. HOLDING A BIRD FOR EXAMINATION. Pass the first two fingers over the bird's neck, holding the fingers closely enough so the neck is plainly felt between the fingers; the bird will rest quieitly upon finding itself thus firmly held so that it can not push forward nor backward; and it will be more content if it is allowed to close the feet upon the little finger. It becomes very natural to slip the fingers over the neck of the bird, as one removes it from the gathering box.

PLATE VIII, FIG. 2. HOLDING A BIRD FOR BANDING. Draw the bird through the hand with the head in position to close the little finger on the neck to hold firmly; the thumb and forefinger are thus in correct position to hold the leg firmly while placing the band.

Do not grasp a wild bird about the body, as one may injure the bird in trying to prevent escape, when the bird makes an unexpected sudden struggle.

[1] Stopped gain in weight when making feathers rapidly.
[2] Too lively to handle.
[3] Making some feathers and no gain, even a loss in weight.
[4] Flew or rather flopped out of nest, a skinny, miserable specimen.

PLATE IX, FIG. 1. HOUSE TRAP. For description see 'Instructions for Bird Banding' by Frederick C. Lincoln, U. S. Department of Agriculture Circular 170, page 10. Notice the vestibule in the near right corner of the trap; the single outer door standing ajar; then the double inner doors standing ajar; birds will follow the food trail through into the trap; a small proportion of them will learn the way out.

An excellent trap, taking not only small birds, but also the birds too large for the government sparrow trap.

PLATE IX, FIGURE 2. NET OR DROP TRAP. This is a net of string; but wire netting can be used on the same frame; light wood frame 4" high; inch knobs on corners to prevent dropping tight to the ground in case a bird is caught by the frame. Notice door frame, and drop door, to drive the birds into the gathering box, which is also here shown. The net is dropped when the birds gather under it, by pulling the string, so as to jerk away the stick which props it up.

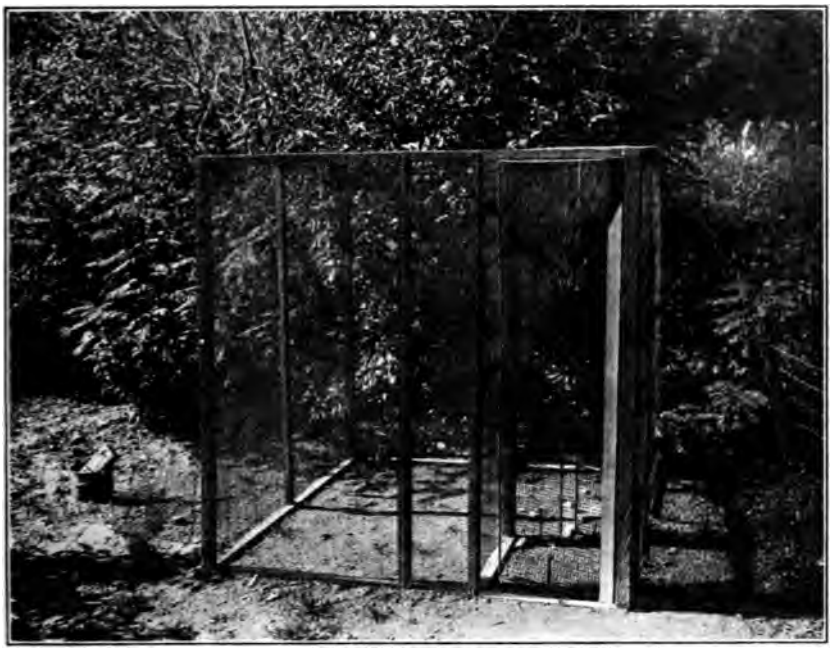
Williamson Building Cleveland, Ohio.

SOME BIRD NOTES FROM INDIAN BAY, MAN.

BY WILLIAM ROWAN.

THE following is a list of birds observed and collected at Indian Bay, Shoal Lake, Lake of the Woods, Man., by my wife and myself, with the Biological Station of the University of Manitoba as headquarters, during the period from June 15 to August 4, 1920. Indian Bay is in Manitoba, the Ontario boundary line running north and south a little way out in the bay and indicated on some of the islands. With the exception of some specimens secured at High Lake, (in Ontario), all were collected in Manitoba. The trip to this lake, as also the one to Falcon Lake, was undertaken primarily to study the avifauna of the huge sheet of muskeg lying between these sheets of water and the Biological Station. The Snake and the Falcon Rivers were the respective water courses followed on these two outings.

The Biological Station, founded this year (1920), is admirably situated for all kinds of field work. There are a number of distinct types of habitat in the immediate neighborhood, three of which are outstanding:—1. The Bay itself; 2. The forest encircling the Bay; 3. The muskeg beyond the forest and stretching forty miles or more to the north and west. Ornithologically the forest was the most fruitful.





PHOTOGRAPHS FROM S. PRENTISS BALDWIN.

1. HOUSE TRAP. 2. NET OR DROP TRAP.

Though this lake appeared to be suited in every way to the feeding habits of these birds, the majority did their fishing in Indian Bay. As soon as the young were strong on the wing (the end of July) they were escorted to the Bay, where the whole colony roosted overnights on a small rocky island. Snake Lake was crowded with wild rice which may have proved an obstacle to fishing in its waters.

5. **Phalacrocorax a. auritus.** DOUBLE-CRESTED CORMORANT.—The first of these birds were seen about the middle of July, after which they became more frequent and sometimes passed over in parties of ten or twelve.

6. **Anas platyrhynchos.*** MALLARD.—Found breeding in the reedy corners of the Bay and lakes, and in the small swamps. Some may have bred in the muskeg, but we got no evidence. Mallards, and indeed all other ducks, were scarce in the neighborhood, owing, no doubt, to the persistent shooting by the Indians throughout the year.

7. **Querquedula discors.** BLUE-WINGED TEAL.—Several times noted on the Falcon River and on Falcon Bay.

8. **Dafila acuta.** PINTAIL.—A single bird was seen flying over the muskeg late in July.

9. **Marila sp.** SCAUP DUCK (LESSER?).—Noted on Falcon Bay only, but a number of times and the species may have bred here.

10. **Oidemia perspicillata.** SURF SCOTER.—Seen twice on Falcon Bay. The bird behaved as though she had young in the reeds, always returning when put up. For this reason she was not collected.

11. **Branta c. canadensis.** CANADA GOOSE.—Two of these birds were put up from a small marsh on the morning of July 6.

12. **Botaurus lentiginosus.*** BITTERN.—Breeding in all the marshes and possibly in the muskeg, though it was not till late in the season that they were noted here, when the families had dispersed and the young were flying well and feeding themselves.

13. **Ardea h. herodias.** GREAT BLUE HERON.—Only three pairs of these beautiful birds were located, one on Indian Bay, one on Snowshoe Bay and the last at High Lake.

14. **Rallus virginianus.*** VIRGINIA RAIL.—Bred commonly in the marshes.

15. **Porzana carolina.*** SORA.—Abundant as a breeder in the marshes and in the reedy portions of the lakes.

16. **Coturnicops noveboracensis.** YELLOW RAIL.—A single Yellow Rail was put out of the reeds in the mouth of the Falcon River in Falcon Lake. The white wing patches made identification certain.

17. **Fulica americana.** COOT.—Found only in the largest marsh where several pairs bred.

18. **Gallinago delicata.** WILSON'S SNIPE.—Not observed till the end of July when wader movements had begun. Several individuals were then noted here and there.

19. **Pisobia minutilla.** LEAST SANDPIPER.—

20. **Ereunetes pusillus.** SEMI-PALMATED SANDPIPER.—A mixed flock of these two sandpipers was noted on Snake Lake on July 30. Judging from the large percentage of pale rumps, the latter species well outnumbered the former.

21. **Limosa haemastica.** HUDSONIAN GODWIT.—A single bird of this species was seen on Snake Lake on July 30. It was still in its red plumage, although its precipitate flight as it twice passed the canoe and its white and black tail would have put identification beyond doubt.

22. **Totanus flavipes.*** YELLOW-LEGS.—Two of these birds were seen on July 22 flying up the railway track. Subsequently they were noted daily, as many as a dozen being seen together.

23. **Tringa s. solitaria.** SOLITARY SANDPIPER. — A single specimen was put out of the bed of the Snake River on June 27 a few miles down from High Lake.

24. **Actitis macularia.*** SPOTTED SANDPIPER.—On July 3 two adults were put up in the gravel pit. The one collected turned out to be a female almost ready to lay. These birds had evidently met with misfortune elsewhere earlier in the season and were hunting for new quarters. A single young one with down still adhering was collected while flying over the canoe on Falcon Lake at the end of July. Another was seen, also towards the end of July on one of the islands in Indian Bay. These were the only birds of their kind noted.

25. **Oxyechus vociferus** KILLDEER.—Only one nesting pair was located near the metre house. Towards the end of July the species became more or less plentiful.

26. **Charadius meloda.** PIPING PLOVER.—A single bird seen on the shore of the Bay on July 24.

27. **Bonasa umbellus togata.*** CANADA RUFFED GROUSE.—Of general distribution and breeding freely. Most of the broods noted were numerically small.

28. **Cathartes aura septentrionalis.*** TURKEY BUZZARD.—It is difficult to estimate the abundance of these birds on account of their extensive peregrinations in search of food. They were constantly seen on Indian, Snowshoe and Falcon Bays. Also at High Lake.

29. **Circus hudsonius.** MARSH HAWK. —A fairly plentiful breeder in the whole district.

30. **Accipiter velox.** SHARP-SHINNED HAWK.—Seen only twice on the way to High Lake.

31. **Buteo platypterus.** BROAD-WINGED HAWK.—This species appears to be a breeder here. It was noted in June and July in the wilder parts of the muskeg, where the rocky "islands" were plentiful and thickly clothed with huge trees. Another hawk, which may have been the Red-shouldered or the Swainson's, frequented the same ground.

32 EAGLE.—Two young eagles, whether Bald or Golden could not be ascertained as they kept out of range, were seen on High Lake.

33. **Falco s. sparverius.** SPARROW HAWK.—Breeding here and there, though not abundantly.

34. **Pandion haliaetus carolinensis.** OSPREY.—Several pairs bred in the district.

35. **Bubo virginianus.** GREAT HORNED OWL.—Owls were apparently rare here. This species and the next were the only ones seen or heard, one pair—almost certainly breeding—of each. The loud sonorous hoot of this owl was heard almost nightly throughout the stay, always around the same spot. This was on the densely forrested edge of the muskeg and though two hunts were made for him, nothing more than a newly moulted feather was found.

36. **Surnia ulula caparoch.** HAWK OWL.—One of these birds was seen six or seven times during the stay, at the bathing beach, always when we were in the water and the gun on land. Twice it came over our heads at a low level, which, if tantalizing, at all events made identification certain.

37. **Coccyzus erythrophthalmus.*** BLACK-BILLED CUCKOO.—A single pair of these birds was found breeding, though the specimen collected, an adult female, towards the end of July, was secured nearly a mile from the breeding spot and may have come from elsewhere. The only other of this species seen, was noted by Mr. Dunn in the grave yard a few days later

38. **Ceryle a. alcyon.*** BELTED KINGFISHER.—Bred in large numbers. In the big gravel pit alone over a dozen nesting holes of the year were found. This pit was almost a quarter of a mile from the lake. The Lake's edge, on account of its rocky nature, offered but few suitable sights and most of the nests were inland, some nearly a mile from the open water.

39. **Dryobates v. villosus.*** HAIRY WOODPECKER.—Nesting fairly plentifully, though in nothing like the numbers of the Downy and the Sapsucker. *D. v. leucomelas*, if it occurs here, was not collected or detected.

40. **Dryobates pubescens medianus.*** DOWNY WOODPECKER.—Probably the most abundant of the Woodpeckers, although the Sapsucker rivalled it closely. The Downy was however of wider distribution, nesting everywhere where suitable trees were to be found.

41. **Picoides arcticus.*** ARCTIC THREE-TOED WOODPECKER.—Not noted on Indian Bay, but found breeding on High Lake. It was noted on Falcon Lake by Prof. De Lury and his brother early in August, although we failed to find it there a little earlier.

42. **Sphyrapicus v. varius.*** YELLOW-BELLIED SAPSUCKER.—Breeding abundantly though mainly confined to the rocky areas. It was never found on the edge of the muskeg like the Downy.

43. **Phloeotomus pileatus abieticola.*** NORTHERN PILEATED WOODPECKER.—Breeding at the Bay and at High Lake, though scarce and apparently confined to the big tree areas.

44. **Colaptes auratus luteus.*** NORTHERN FLICKER.—Breeding fairly commonly throughout the district and general in distribution.

5. **Chordeiles v. virginianus.*** NIGHTHAWK.—An abundant breeder throughout on rocky ground. Straggling flocks were formed towards the end of July, the birds becoming more and more diurnal.

46. **Chaetura pelagica.*** CHIMNEY SWIFT.—This species nested in the chimney of one of the buildings and on the railway water tank. Never noted far from these two centres.

47. **Archilochus colubris.*** RUBY-THROATED HUMMINGBIRD.—Abundant everywhere.

48. **Tyrannus tyrannus.*** KINGBIRD.—A common breeder on the edge of the Bay, lakes and rivers and particularly on the muskeg.

49. **Sayornis phoebe.*** PHOEBE.—The most abundant of the Fly-catchers round the station where nesting sites were plentiful if not suitable. One nest kept under observation fell four times during the season. The fifth attempt was in progress when we left. Many chose unfortunate spots, but all persisted to the bitter end in trying to achieve the impossible rather than use a new site. Many of the successful ones reared two broods from the same nest. Even in remote spots this bird was plentiful, fallen tree trunks providing the majority of nesting sites.

50. **Nuttallornis borealis.*** OLIVE-SIDED FLYCATCHER.—Found only on the edge of one of the marshes where the regular presence of the birds led one to believe that they had a nest, but this was never found.

51. **Myiochanes virens.** WOOD PEWEE.—But few of these birds were located, all in the deeper woods.

52. **Empidonax flaviventris.*** YELLOW-BELLIED FLYCATCHER.—A single specimen was observed and subsequently collected on one of the islands in the Bay.

53. **Empidonax minimus.*** LEAST FLYCATCHER.—Commoner than either of the three foregoing species, but by no means abundant.

54. **Cyanocitta c. cristata.*** BLUE JAY.—Breeding here and there. Not plentiful.

55. **Perisoreus c. canadensis.** CANADA JAY.—Three of these birds were seen while portaging from Snake Lake to the Falcon River on July 29. The portage necessitated two trips and both guns were unfortunately left for the second load.

56. **Corvus b. hesperis.*** CROW.—Abundant everywhere. Small flocks were forming in the middle of July, but many young were still being fed at the close of that month.

57. **Molothrus a. ater.*** COWBIRD.—Abundant. Flocking began early in July when the old birds left the district. Only two young were observed, one on the wing, accompanied by Chipping Sparrows, the other still in the nest of a White-throated Sparrow. The latter disappeared before he was fully fledged. The mortality amongst ground-nesters was enormous. Not a single ground nest found, and kept under observation, (with the exception of Grouse) produced young far enough advanced to

fly. Either the eggs or the chicks were in every case destroyed by squirrels or chipmunks which were very abundant. (It may be of interest to note in this connection that the Flying Squirrel was never observed here.)

58. **Agelaius phoeniceus.*** RED-WINGED BLACKBIRD.—This and the Grackle were the most plentiful of the Blackbirds, the present species being of more general distribution. They were found nesting in all the marshes and throughout the muskeg where bushes or reeds occurred. Young began to fly from the last week of June.

59. **Icterus galbula.*** BALTIMORE ORIOLE.—Fairly plentiful. Several pairs bred round the buildings and a few were noted here and there in the bush.

60. **Quiscalus quiscula aeneus.*** BRONZED GRACKLE.—A large colony of these birds bred on the edge of a small marsh about half a mile from the station. A solitary pair was also noted on High Lake.

61. **Hesperiphona vespertina** (subsp ?).* EVENING GROSBEAK.—As already recorded in 'The Auk,' the e birds no doubt bred here, though in very limited numbers. On July 24 an old bird with a single young one still being fed was noted on one of the islands but not secured. On the 26th, however, a family was found on the main land and a young bird collected and later another and an adult female.

62. **Carpodacus p. purpureus.*** PURPLE FINCH.—Of general distribution though not very plentiful.

63. **Astragalinus t. tristis.*** GOLDFINCH.—Plentiful immediately around the station and also further afield.

64. **Spinus pinus.*** PINE SISKIN.—Frequently seen, mostly in the company of Goldfinches, round the buildings. Also noted at Falcon Lake.

65. **Pooecetes g. gramineus.*** VESPER SPARROW.—Only a single pair was found nesting in the gravel pit.

66. **Passerculus sandwichensis** (subsp?). SAVANNAH SPARROW.—Not abundant but of fairly general distribution. No specimens were collected and the subspecies not determined.

67. **Zonotrichia albicollis.*** WHITE-THROATED SPARROW.—With the doubtful exception of the Song, by far the most abundant of the sparrows. Found nesting everywhere in the wooded areas.

68. **Spizella p. passerina.*** CHIPPING SPARROW.—Thinly but generally distributed. Two broods appeared to be the rule with this species.

69. **Spizella pallida.** CLAY-COLOURED SPARROW.—Two or three pairs only were found, all in the vicinity of the station.

70. **Junco h. hyemalis.*** SLATE-COLOURED JUNCO.—Several pairs were located, though they were by no means plentiful.

71. **Melospiza melodia juddi.*** SONG SPARROW.—Very abundant and breeding everywhere.

72. **Melospiza georgiana.*** SWAMP SPARROW.—Plentiful in the muskeg and in the swamps.

73. **Passer domesticus.** HOUSE SPARROW.—A few pairs nested round the railway buildings. Also noted at the Indian school on Snowshoe Bay.

74. **Zamelodia melanocephala.*** ROSE-BREASTED GROSBEAK.—A few pairs bred here and there. Young as well as adults were secured.

75 **Piranga erythromelas.*** SCARLET TANAGER.—Noted only on Falcon Bay where a family of three or four was being escorted by its parents.

76. **Petrochelidon lunifrons.** CLIFF SWALLOW.—A single bird of this species was observed sitting on the telephone wires late in July.

77. **Hirundo erythrogastra.** BARN SWALLOW.—The bi-weekly train came in one evening in July with a freight car picked up from a siding and destined for Winnipeg the next day. This car held the nest of a pair of Barn Swallows. The parent birds arrived with the train and left with it again the next morning. These were the only birds of their kind observed.

78. **Iridoprocne bicolor.** TREE SWALLOW.—Abundant round the station and on the muskeg wherever trees occurred.

79. **Stelgidopteryx serripennis.*** ROUGH-WINGED SWALLOW.—A small colony of these birds nested in the east bank of the large gravel pit. There were about twenty nests. No Bank Swallows were apparently included. They were early in their departure and had left the place entirely by the end of July.

80. **Bombycilla cedrorum.*** CEDAR WAXWING —Generally distributed in some numbers throughout the district.

81. **Vireosylva olivacea.*** RED-EYED VIREO.—Extremely abundant and found nesting everywhere.

82. **Vireosylva g. gilva** WARBLING VIREO.—Found here and there but not plentiful. Only a single nest was found.

83. **Mniotilta varia.*** BLACK-AND-WHITE WARBLER.—One of the most abundant of the warblers and general in its distribution.

84 **Dendroica a. aestiva.*** YELLOW WARBLER.—Fairly abundant, but apparently confined as a nester to the drier parts.

85. **Dendroica c. caerulescens.** BLACK-THROATED BLUE WARBLER.—Only a single specimen of this beautiful bird, a male, was seen in some thick brush near the station in the middle of June. It was so close that shooting was out of the question while the growth was too thick for the bird to remain in view at anything like a reasonable distance. This annoying contingency frequently arose with the warblers.

86. **Dendroica magnolia.*** MAGNOLIA WARBLER.—A scarce breeder. Only two birds, both males, were seen or heard. One always sang from the same spot and no doubt had his mate and nest there.

87. **Dendroica pensylvanica.*** CHESTNUT-SIDED WARBLER.—Abundant and found breeding everywhere.

88. **Dendroica castanea.*** BAY-BREASTED WARBLER.—A single pair

bred near the station. A family was also noted on Falcon Lake at the end of July.

89. **Dendroica fusca.*** BLACKBURNIAN WARBLER.—Except for the song of a single male heard for weeks at the same spot, where he presumably owned a nest, the note was never heard, nor were other specimens seen.

90. **Dendroica vigorsi.*** PINE WARBLER.—Only three or four birds of this species were noted throughout the stay.

91. **Dendroica p. palmarum.*** PALM WARBLER.—Only seen on one of the islands, where it bred and a young bird was collected.

92. **Seiurus aurocapillus.** OVEN-BIRD.—Thinly distributed over most of the area.

93. **Seiurus n. noveboracensis.** WATER-THRUSH.—A pair bred and reared their young successfully on one of the islands. Not noted elsewhere.

94. **Oporornis philadelphia.*** MOURNING WARBLER.—A single specimen of this species was noted near the station in the middle of June and a family party was seen near the same place towards the close of July.

95. **Geothlypis t. trichas.*** MARYLAND YELLOW-THROAT.—Fairly abundant on the edge of marshes and in the muskeg where bushes occurred.

96. **Setophaga ruticilla.*** REDSTART.—Extremely abundant and of general distribution.

97. **Dumetella carolinensis.*** CATBIRD.—A few pairs bred round Falcon and Indian Bays.

98. **Troglodytes a. aedon.*** HOUSE WREN.—Thinly but fairly generally distributed.

99. **Cistothorus stellaris.*** SHORT-BILLED MARSH WREN.—Plentiful on the floating muskeg.

100. **Telmatodytes p. palustris.*** LONG-BILLED MARSH WREN.—Abundant in some of the marshes.

101. **Sitta canadensis.** RED-BREASTED NUTHATCH.—Only noted once, on the edge of Indian Bay.

102. **Penthestes a. atricapillus.*** CHICKADEE.—A fairly abundant breeder of general distribution.

103. **Hylocichla f. fuscescens.*** VEERY.—The most abundant of the Thrushes and of general distribution

104. **H. ustulata swainsoni.*** OLIVE-BACKED THRUSH.—Not nearly as plentiful as the Veery, but found throughout the district, particularly on the islands.

105. **H. guttata pallasi.*** HERMIT THRUSH.—The scarcest of the Thrushes and only noted on a small area near the station, where they were deemed to breed from the constant singing of the males.

106. **Planesticus m. migratorius.** ROBIN.—Thinly but generally distributed throughout.

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BIRDS OF BOWLING GREEN, KENTUCKY.

BY GORDON WILSON.

So far as I know, no complete résumé of bird life in this section has ever been made. Could I have found just such a report when I began my observations, I would have been spared years of uncertainty and the discouragement which comes from not having any means of checking up one's knowledge. I have prepared this article partly as a summary for my own guide in the future and partly as a suggestion to others who may take up this fascinating study in this section.

Bowling Green is located on the Big Barren River, 110 miles south of Louisville, Kentucky, and 75 miles north of Nashville, Tenn. The town is built on and around two knobs which are three miles east of the easternmost range of the knobs. Many of these hills are still wooded, and are bordered by fields covered with shrubby cedars, hackberries, elms, and persimmons, with wild tangles of greenbriars and honeysuckle. The bottoms, for the most part, are in cultivation, except a narrow strip along the banks of the water courses. There are a few small ponds in this section, but since they are surrounded usually by limestone banks, there is little or no growth plants. The river, with its sheer limestone cliffs, affords little attraction for water birds. Within a mile of the town is Covington's Woods, the greatest place I have ever seen for warblers in the migrating season. Pea Ridge, the last ridge of the knobs, is the place where I have found the members of the goatsucker family, the Pileated Woodpecker, and other retiring birds. Normal Heights, one of the isolated knobs and the site of the Western Kentucky State Normal School, was until the bag-worm plague of 1918, covered with hoary old cedars, the favorite nesting place of the Bronzed Grackle, the Cardinal, and the Robin. One day in 1912, I found 75 nests of the Bronzed Grackle on this knob alone.

My observations have been made up largely by means of field trips, taken weekly or oftener, my average for a year being 60 to 75 trips. In the migrating season I have often gone on trips

four or five times in a single week. Whenever I have seen anything unusual or about which I have been in doubt, I have consulted Professor J. H. Clagett, formerly observer for the Biological Survey, and Mr. Carl D. Herdman, a prominent local citizen who has a very comprehensive ornithological library. I have been greatly benefited by the bulletins prepared by Mr. W. L. McAtee, now of the Biological Survey, on the birds near Bloomington, Indiana, and that by Mr. Albert F. Ganier, Curator of the Tennessee Ornithological Society, on the birds of Middle Tennessee. I desire to use this opportunity to thank these two gentlemen for their aid in my study.

My observations were made between the years 1912 and 1921, and are confined, unless otherwise stated, to a territory about ten miles in diameter, with Bowling Green as its center.

Larus argentatus. HERRING GULL.—One seen over Normal Heights at very close range, April 19, 1918.

Anas platyrhynchos. MALLARD.—Rare migrant. February 26–May 5; November 28–December 24.

Querquedula discors. BLUE-WINGED TEAL.—Rare spring migrant. April 3–20.

Aix sponsa. WOOD DUCK.—One seen April 5, 1918; another, July 30, 1921. Apparently it used to summer here in numbers, judging by reports from fishermen along the river.

Marila valisineria. CANVAS-BACK.—One seen on the river in company with six Ruddy Ducks, April 7, 1919.

Oidemia deglandi. WHITE-WINGED SCOTER.—Numbers seen on Rich Pond, eight miles south of here, April 6, 1912. I studied this flock for more than an hour with high-power binoculars.

Erismatura jamaicensis. RUDDY DUCK.—Six seen on river, April 7, 1919; one seen April 18, 1921.

Branta canadensis canadensis. CANADA GOOSE.—Common migrant. February 26–May 7; September 22–November 12.

Ixobrychus exilis. LEAST BITTERN.—One seen May 1, 1920.

Ardea herodias herodias. GREAT BLUE HERON.—One seen April 12, 1919; one killed near here September 25, 1921. Formerly rather common here.

Florida caerulea. LITTLE BLUE HERON.—A very rare summer resident. April 8–September 21.

Butorides virescens virescens. GREEN HERON. Fairly common summer resident, more abundant in migrations. April 18–September 23.

Rallus virginianus. VIRGINIA RAIL.—One seen September 18, another September 21, 1918.

Porzana carolina. CAROLINA RAIL OR SORA. Two seen May 4, 1918, both wounded by flying into telephone wires at night.

Ionornis martinicus. PURPLE GALLINULE.—One shot near town in April, 1916.

Gallinula galeata. FLORIDA GALLINULE.—One seen on the river, Aug. 24, 1921.

Fulica americana. AMERICAN COOT.—Rare spring migrant. March 30–May 5.

Philohela minor. AMERICAN WOODCOCK.—Several seen, April 18–23, 1921.

Gallinago delicata. WILSON SNIPE.—Fairly common migrant. March 9–May 11; August 24–November 2.

Pisobia maculata. PECTORAL SANDPIPER.—Rare migrant. May 1–3; August 23–October 8.

Pisobia minutilla. LEAST SANDPIPER.—Rare migrant. April 15–May 14; Aug. 4–Sept. 7.

Ereunetes pusillus. SEMIPALMATED SANDPIPER.—One seen September 4, 1919; another May 1, 1920; another, September 15, 1921.

Totanus melanoleucus. GREATER YELLOW-LEGS.—Rare spring migrant. April 10–May 14.

Totanus flavipes. LESSER YELLOW-LEGS.—Rare migrant. March 27–May 7; September 15–October 8.

Tringa solitaria solitaria. SOLITARY SANDPIPER.—Fairly common migrant, more abundant in the fall. April 10–May 17; July 28–October 11.

Actitis macularia. SPOTTED SANDPIPER.—Rare summer resident. March 29–October 13.

Oxyechus vociferus. KILLDEER.—Resident; common in summer, rare in winter.

Colinus virginianus virginianus. BOBWHITE. Resident. Becoming rather rare, though formerly common.

Zenaidura macroura carolinensis. MOURNING DOVE. Resident. Abundant in summer, fairly common in winter.

Cathartes aura septentrionalis. TURKEY VULTURE. Resident. Common in summer, rare in winter.

Coragyps urubu. BLACK VULTURE. Resident. Common to abundant, especially around the slaughter house on Jennings Creek.

Circus hudsonius. MARSH HAWK Rare winter resident. September 4–March 23.

Accipiter velox. SHARP-SHINNED HAWK Rare resident.

Accipiter cooperi. COOPER'S HAWK. Rare resident.

Astur atricapillus atricapillus. AMERICAN GOSHAWK.—One seen at very close range on Normal Heights, February 2, 1918. Apparently brought here by the rigorous winter

Buteo borealis borealis RED-TAILED HAWK. Very rare resident.

Buteo lineatus lineatus. RED-SHOULDERED HAWK. Very rare resident.

Buteo platypterus. BROAD-WINGED HAWK. Very rare winter resident. September 7–March 29.

Aquila chrysaetos. GOLDEN EAGLE. One captured in April, 1919, near here and exhibited by the local chapter of the Red Cross.

Falco sparverius sparverius. SPARROW HAWK. Fairly common resident.

Tyto pratincola. BARN OWL. One shot near town in 1914 and preserved by a local taxidermist; another captured alive in August, 1921.

Asio wilsonianus. AMERICAN LONG-EARED OWL.—One seen March 14, another April 13, 1918.

Syrnium varia varia. BARRED OWL. Very rare resident.

Otus asio asio. SCREECH OWL. Fairly common resident.

Bubo virginianus virginianus. GREAT HORNED OWL. Very rare resident

Coccyzus americanus americanus. YELLOW-BILLED CUCKOO.—Common summer resident, a little commoner in the spring migration. April 4–Oct. 6.

Coccyzus erythrophthalmus. BLACK-BILLED CUCKOO —Fairly common migrant, seen nearly every year in both spring and fall. April 24–May 18; September 18–27.

Ceryle alcyon alcyon. BELTED KINGFISHER.—Rather rare and erratic. It did not winter here in 1915–1916, 1916–1917, 1919–1920, but was seen during the other winters. Only a few pairs are ever seen here in the nesting season.

Dryobates villosus villosus. HAIRY WOODPECKER. Common resident, a little more common in winter.

Dryobates pubescens pubescens. SOUTHERN DOWNY WOODPECKER. —Common resident, more common in winter.

Sphyrapicus varius varius. YELLOW-BELLIED SAPSUCKER. Fairly common winter resident until the winter of 1919–1920, since when it has been very rare. September 23–May 17.

Phloeotomus pileatus pileatus. PILEATED WOODPECKER.—Rather rare resident, found only along Pea Ridge and in other similar places.

Melanerpes erythrocephalus. RED-HEADED WOODPECKER. Abundant summer resident. The bird puzzles me by its not remaining here through the winter. In nearly all other parts of the state it is to be found at all times of the year. March–October 9.

Centurus carolinus. RED-BELLIED WOODPECKER. Common resident, commoner in fall.

Colaptes auratus auratus. FLICKER. Resident. Common n summer, fairly common in winter.

Antrostomus carolinensis. CHUCK-WILL'S-WIDOW. Fairly common summer resident April 25–Aug. 17.

Antrostomus vociferus vociferus. WHIP-POOR-WILL. Fairly common summer resident, but more restricted in range than the Chuck-will's-widow. April 6–July 25.

Chordeiles virginianus virginianus. NIGHTHAWK. Common summer resident. April 17–October 20.

Chaetura pelagica. CHIMNEY SWIFT. Abundant summer resident and exceedingly abundant in the fall migration. Thousands in late summer and early fall roost in the large chimneys at the State Normal and at Davidson Brothers' Wholesale House. April 1–October 16.

Archilochus colubris. RUBY-THROATED HUMMINGBIRD. Fairly common summer resident. I saw more around one blossoming horse-chestnut tree on May 1, 1920, than I usually see in an entire season. April 22–October 15.

Tyrannus tyrannus. KINGBIRD. Common summer resident. April 19–September 23.

Myiarchus crinitus. CRESTED FLYCATCHER. Common summer resident. April 19–September 19.

Sayornis phoebe. PHOEBE. Fairly common summer resident. Especially fond of the cliffs along the river and the entrances to the caves as building sites. March 9–October 23.

Nuttallornis borealis. OLIVE-SIDED FLYCATCHER. Rare migrant. The first one I ever saw here flew down a chimney into an empty cook-stove. May 11–23; September 16–October 25.

Myiochanes virens. WOOD PEWEE. Common summer resident. April 21–October 8.

Empidonax virescens. GREEN-CRESTED OR ACADIAN FLYCATCHER.—Fairly common summer resident, especially along the river above town April 21–October 4.

Empidonax minimus. LEAST FLYCATCHER. Rare migrant. It very seldom gives its distinctive call while it is here. April 1–May 14; September 7–September 28.

Otocoris alpestris praticola. PRAIRIE HORNED LARK. Common winter resident, sometimes almost abundant. July 28–May 11.

Cyanocitta cristata cristata. BLUE JAY. Common resident.

Corvus brachyrhynchos brachyrhynchos. CROW. Resident. Common in summer, abundant in winter. There are three great crow roosts in my territory: one on the Nashville Pike near Lost River, about three miles from town; another on Jennings Creek near the slaughter house; and another on the Morgantown Pike, about four miles from town.

Dolichonyx oryzivorus. BOBOLINK. Common spring migrant, very abundant in 1917 and 1921. I have never seen or heard of Bobolinks in the fall migration. April 27–May 17.

Molothrus ater ater. COWBIRD. Common summer resident, frequently very abundant in the fall. In 1915 I found a Cowbird's egg in the nest of a Wood Thrush, the only time I have ever seen one in the

nest of a larger bird. As the nest was broken up before incubation was completed I could not observe the struggle between the parasite and the real owners of the nest. March 5–October 16.

Agelaius phoeniceus phoeniceus. RED-WINGED BLACKBIRD. Common summer resident, abundant in migrations. March 1–November 10.

Sturnella magna magna. MEADOWLARK. Common resident, a little less common in winter.

Icterus spurius. ORCHARD ORIOLE. Common summer resident. April 17–August 24.

Icterus galbula. BALTIMORE ORIOLE. Common summer resident. April 12–September 17.

Euphagus carolinus. RUST BLACKBIRD. Fairly common migrant. April 3–23; August 17–December 7.

Quiscalus quiscula aeneus. BRONZED GRACKLE. Abundant migrant and common summer resident. Only a small number nest here now as compared with five years ago, before many of the cedars of their breeding-places were killed by the bagworm plague. A flock was reported seen January 22, 1921. February 4–November 27.

Carpadacus purpureus purpureus. PURPLE FINCH. Formerly a very abundant winter resident, but for the past three winters almost rare. October 16–May 8.

Loxia curvirostra minor. CROSSBILL. Three seen and many others heard, January 19, 1920.

Astragalinus tristis tristis. AMERICAN GOLDFINCH. Common resident.

Pooecetes gramineus gramineus. VESPER SPARROW. Almost abundant migrant. March 12–May; October 7–October 30.

Passerculus sandwichensis savanna. SAVANNAH SPARROW. Common migrant. May 1–May 11; October 8–October 24.

Ammodramus savannarum australis. GRASSHOPPER SPARROW.—Common summer resident, more common in the spring migration. March 26–September 4.

Passerherbulus henslowi henslowi. HENSLOW SPARROW.—Fairly common migrant. April 23–May 16; September 6–October 24.

Chondestes grammacus grammacus. LARK SPARROW. Migrant. Common in spring but seen only once in the fall, October 18, 1919. This bird nests commonly in counties of this state farther west. March 27–May 5.

Zonotrichia leucophrys leucophrys. WHITE-CROWNED SPARROW. Abundant winter resident, apparently becoming more abundant. Found in fewer places than is the White-throated Sparrow but more abundant. October 11–May 11.

Zonotrichia albicollis. WHITE-THROATED SPARROW. Common winter resident. September 23–May 17.

Spizella monticola monticola. TREE SPARROW. Never seen

here until the hard winter of 1917–1918, but since then it has been a common winter resident, becoming more common each winter, and widely distributed in its range. October 21–March 12

Spizella passerina passerina. Chipping Sparrow. Resident. Common in summer, rare in winter.

Spizella pusilla pusilla. Field Sparrow. Common summer resident, rather rare in winter.

Junco hyemalis hyemalis. Slate-colored Junco. Abundant winter resident. October 4–April 19.

Poocetes gramineus bachmanni Bachman's Sparrow. Common summer resident though restricted in its range. March 26–August 22.

Melospiza melodia melodia. Song Sparrow Common winter resident. October 7–April 27.

Melospiza lincolni lincolni. Lincoln Sparrow. Fairly common migrant. March 8–May 7; September 20–October 24.

Melospiza georgiana. Swamp Sparrow. Rare migrant April 5–May 8; October 13–14.

Passerella iliaca iliaca. Fox Sparrow. Rare migrant but regularly seen. February 12–March 24; October 13–November 10.

Pipilo erythrophthalmus erythrophthalmus. Towhee. Resident. Common in summer, a little less common in winter.

Cardinalis cardinalis cardinalis. Cardinal. Abundant resident.

Zamelodia ludoviciana. Rose-breasted Grosbeak. Fairly common migrant. April 20–May 15; September 19–October 13.

Guiraca caerula caerula. Blue Grosbeak. I have only one record: two seen in a shrub in the city, April, 1912.

Passerina cyanea. Indigo Bunting. Common summer resident. April 21–October 16.

Spiza americana. Dickcissel. Common summer resident, but a little erratic, sometimes disappearing in mid-summer. April 29–August 22.

Piranga erythromelas. Scarlet Tanager. Rare migrant, a full-plumaged male being rarely seen. April 18–May 19; September 6–September 30.

Piranga rubra rubra. Summer Tanager. Common summer resident. April 2–September 26.

Progne subis subis. Purple Martin. Abundant summer resident, largely through the efforts of Mr. Carl D. Herdman, who has put up a great many martin boxes and has encouraged others to do so. March 15–September 25.

Petrochelidon lunifrons lunifrons. Cliff Swallow. Rare summer resident, fairly common in the spring migration. March 24–September 18.

Hirundo erythrogastra. Barn Swallow. Fairly common summer resident, commoner in the migrations. April 20–September 17.

Iridoprocne bicolor. TREE SWALLOW.—Rare spring migrant. May 1–May 8.

Riparia riparia. BANK SWALLOW. Rare summer resident. April 8–September 6.

Stelgidopteryx serripennis. ROUGH-WINGED SWALLOW. One seen May 7, 1921.

Bombycilla cedrorum. CEDAR WAXWING.—Common winter resident, a little less common than it was before the hard winter of 1917–1918. Though it remains very late in the spring and returns sometimes in midsummer, I have never seen it in July or found its nest. Evidently it nests in the northern part of this state. August 17–June 12.

Lanius ludovicianus migrans. MIGRANT SHRIKE. Very rare summer resident. One nest found in 1912. February 15–October 24.

Vireosylva olivacea. RED-EYED VIREO. Common summer resident. April 8–September 27.

Vireosylva gilva gilva. WARBLING VIREO. Common summer resident. April 8–October 8.

Lanivireo flavifrons. YELLOW-THROATED VIREO. Fairly common summer resident, found only in deep woods and other secluded places. Apri 19–September 29.

Lanivireo solitarius solitarius. BLUE-HEADED VIREO. Very rare summer resident. May 8–November 4.

Vireo griseus griseus. WHITE-EYED VIREO. Common to abundant resident. April 7–October 10.

Mniotilta varia. BLACK AND WHITE WARBLER. Fairly common summer resident, March 29–October 6.

Protonotaria citrea. PROTHONOTARY WARBLER. Fairly common summer resident. April 5–September 28.

Helmitheros vermivorus. WORM-EATING WARBLER.—Rare spring migrant. April 3–May 9.

Vermivora pinus. BLUE-WINGED WARBLER. Rare migrant. April 19–May 19; September 25–October 5.

Vermivora rubricapilla rubricapilla. NASHVILLE WARBLER. Fairly common migrant. May 1–May 19; August 31–October 1.

Vermivora peregrina. TENNESSEE WARBLER Abundant migrant, especially in the fall. April 19–May 10; September 7–October 24.

Compsothlypis americana usneae. NORTHERN PARULA WARBLER.—Rare spring migrant. May 3–19.

Dendroica tigrina. CAPE MAY WARBLER.—Fairly common migrant. April 19–May 13; September 17–October 14.

Dendroica aestiva aestiva. YELLOW WARBLER. Fairly common summer resident. April 13–August 8.

Dendroica caerulescens caerulescens. BLACK-THROATED BLUE WARBLER.—Rare migrant, the full-plumaged male especially. May 7–May 13; September 22–October 7.

Dendroica coronata. MYRTLE WARBLER.—Common winter resident and abundant migrant. September 5–May 19.

Dendroica magnolia. MAGNOLIA WARBLER.—Fairly common migrant. April 19–May 17; October 13.

Dendroica pensylvanica. CHESTNUT-SIDED WARBLER. Common to abundant migrant in spring, very rare in fall. April 18–May 11; Sept. 20.

Dendroica castanea. BAY-BREASTED WARBLER. Fairly common migrant. May 3–May 19; September 28–October 6.

Dendroica striata. BLACKPOLL WARBLER.—Common migrant, nearly always being the last of the warblers to arrive in spring. May 5–22; September 17–October 3.

Dendroica fusca. BLACKBURNIAN WARBLER. Fairly common migrant. April 25–May 13; September 8–October 8.

Dendroica dominica albilora. SYCAMORE WARBLER.—Rare summer resident. I found a nest in a sycamore tree near the boatlanding three successive years, 1918–1920. March 27–October 7.

Dendroica virens. BLACK-THROATED GREEN WARBLER.—Common spring migrant, very abundant fall migrant. April 23–May 14; Sept. 7–October 16.

Dendroica vigorsi. PINE WARBLER.—Fairly common migrant. April 19–May 13; September 11–October 17.

Dendroica palmarum palmarum. PALM WARBLER.—Abundant spring migrant, fairly common in the fall. April 19–May 13; September 7–September 30.

Dendroica discolor. PRAIRIE WARBLER.—Rare summer resident, found breeding only in a side valley opening into the river bottom, but found regularly there. April 6–October 15.

Seiurus aurocapillus. OVENBIRD.—Rare summer resident, breeding in only two places in my territory. April 10–October 12.

Seiurus noveboracensis noveboracensis. WATER THRUSH.—Rare migrant. April 27–May 8; September 4–October 8.

Seiurus motacilla. LOUISIANA WATER-THRUSH.—Fairly common migrant, and probably a rare summer resident. April 25–May 24; August 19–October 18.

Oporornis formosus. KENTUCKY WARBLER.—Rare summer resident, found breeding only near Underwood's Schoolhouse, about three miles from town. April 21–August 20.

Oporornis agilis. CONNECTICUT WARBLER.—Rare migrant. April 21–May 14; October 8.

Oporornis philadelphia. MOURNING WARBLER.—Fairly common migrant. April 20–May 20; September 19–October 2.

Geothlypis trichas trichas. MARYLAND YELLOW-THROAT. Common summer resident. April 14–October 29.

Icteria virens virens. YELLOW-BREASTED CHAT. Common summer resident. April 20–September 23.

Wilsonia citrina. HOODED WARBLER.—Rare migrant. April 13–June 6; August 20–October 15.

Wilsonia pusilla pusilla. WILSON'S WARBLER.—Fairly common migrant. April 18–May 13; September 6–Sept. 29.

Wilsonia canadensis. CANADA WARBLER.—Rare migrant. April 28–May 16; September 17–September 25.

Setophaga ruticilla. AMERICAN REDSTART.—Abundant migrant and fairly common summer resident. April 4–September 30.

Anthus rubescens. AMERICAN PIPIT or TITLARK. Migrant. Very erratic. A few seen April 6, 1912; hundreds seen May 1 and 8, 1920; ten or more seen April 23, 1921.

Mimus polyglottos polyglottos. MOCKINGBIRD.—Common to abundant in summer, fairly common in winter.

Dumetella carolinensis. CATBIRD. Common to abundant summer resident. April 14–October 25.

Toxostoma rufum. BROWN THRASHER. Common to abundant summer resident. March 5–October 13.

Thryothorus ludovicianus ludovicianus. CAROLINA WREN. Resident. Common in summer, fairly common in winter.

Thyomanes bewicki bewicki. Resident. Common in summer, a little more common in winter than the Carolina.

Nannus hiemalis hiemalis. WINTER WREN.—Fairly common migrant. February 22–May 18; October 21–October 25. I hear its song nearly every spring and occasionally in the fall.

Cistothorus stellaris. SHORT-BILLED MARSH WREN.—One seen May 5, 1917, another April 27, 1918.

Telmatodytes palustris palustris. LONG-BILLED MARSH WREN.—Rare migrant. May 5– ; September 21–September 28.

Certhia familiaris americana. BROWN CREEPER.—Fairly common to common winter resident, more numerous in migrations. October 4–May 21.

Sitta carolinensis carolinensis. WHITE-BREASTED NUTHATCH.—Fairly common resident, being very local in its distribution.

Sitta canadensis. RED-BREASTED NUTHATCH.—Rare migrant. April 27–May 4; October 3–November 4.

Baeolophus bicolor. TUFTED TITMOUSE.—Common to abundant resident, more numerous in winter than in summer.

Parus carolinensis carolinensis. CAROLINA CHICKADEE.—Common to abundant resident, more numerous in winter.

Regulus satrapa satrapa. GOLDEN-CROWNED KINGLET.—Common winter resident until the winter of 1917–1918; just now becoming common again. October 13–April 27.

Regulus calendula calendula. RUBY-CROWNED KINGLET.—Fairly common migrant. March 22–May 7; September 23–November 5.

Polioptila caerula caerula. BLUE-GRAY GNATCATCHER.—Common summer resident. March 24–September 27.

Hylocichla mustelina. WOOD THRUSH.—Common summer resident. March 22–October 14.

Hylocichla fuscescens fuscescens. VEERY.—Fairly common spring migrant, very rare in the fall. April 1–May 11; Sept. 18.

Hylocichla aliciae aliciae. GRAY-CHECKED THRUSH.—Common to abundant migrant. April 21–May 28; September 20–October 23.

Hylocichla ustulata swainsoni. OLIVE-BACKED THRUSH.—Common to abundant migrant. Nearly every year I find one or more wounded by flying against telephone wires, or buildings. April 17–May 19; September 20–October 18.

Hylocichla guttata pallasi. HERMIT THRUSH.—Rare migrant. March 12–May 14; September 16–October 24.

Planesticus migratorius migratorius. AMERICAN ROBIN.—Resident. Abundant in summer, fairly common in winter.

Sialia sialis sialis. BLUEBIRD.—Common to abundant resident.

The following species I have identified to my entire satisfaction both with and without glasses but no specimens have been taken and knowing the unsatisfactory status of sight identification I agree with the editor that it will be best not to include them in the formal list at present.

Helinaia swainsoni. SWAINSON'S WARBLER.

Vermivora bachmani. BACHMAN'S WARBLER.

Dendroica kirtlandi. KIRTLAND'S WARBLER.

State Normal School, Bowling Green, Kentucky.

SEVENTH ANNUAL LIST OF PROPOSED CHANGES IN THE A. O. U. CHECK-LIST OF NORTH AMERICAN BIRDS

BY HARRY C. OBERHOLSER

This is the Seventh Annual List of proposed A. O. U. 'Check-List' additions and changes in the names of North American birds. Like the six already published,[1] the present list comprises only ornithological cases—*i. e.*, such as require specimens or the identification of descriptions for their determination—and consists of additions, eliminations, rejections, and changes of names due to various causes. However, only changes known to be the result

[1] For these previous lists, see 'The Auk,' XXXIII, October, 1916, pp. 425–431; XXXIV, April, 1917, pp. 198–205; XXXV, April, 1918, pp. 200–217; XXXVI, April, 1919, pp. 266–273; XXXVII, April, 1920, pp. 274–285; XXXVIII, April, 1921, pp. 264–269.

of revisionary work are included; therefore, no mention is here made of changes involved in names in local lists or elsewhere, used without sufficient explanation or not known to be based on original research, of changes or additions queried or but tentatively made, or of the elimination of subspecies by authors who, on general principles, recognize no subspecies. Furthermore, no opinion beyond that of compiler is herein expressed.

This list is intended to include everything pertinent up to December 31, 1921, and nothing after that date has been taken. In view of the volume and widely scattered character of current ornithological literature, it is not unlikely that some names or changes have been overlooked, and the writer would be very thankful for reference to any omissions, in order that such may be duly given a place in next year's list.

ADDITIONS AND CHANGES IN NAMES[1]

Colymbus grisegena holboellii (Reinhardt) becomes **Podotaithya grisegena major** Temminck and Schlegel (*Podiceps rubricollis major* Temminck and Schlegel, in Siebold's Fauna Japonica, 1849, p. 122, pl. 78B; Japan), because generically distinct from *Colymbus* Linnaeus, and because therefore *major* is its earliest tenable subspecific designation. (*Cf.* Oberholser, THE AUK, XXXVIII, No. 1, January, 1921, p. 79.)

† **Gavia immer elasson** Bishop. New subspecies. Bishop, The Auk, XXXVIII, No. 3, July, 1921, p. 367 ("Carpenter Lake, Rolette County, North Dakota"). Range: breeds from northern California and North Dakota north to British Columbia and Manitoba.

Cepphus mandti Mandt becomes **Cepphus grylle mandtii** Mandt, because considered only a subspecies of *Cepphus grylle* (Linnaeus). (*Cf.* Hartert, Vögel paläarkt. Fauna, Heft XV [Band III, 1], April, 1921, p. 1776.)

† **Catharacta chilensis** Bonaparte ([*Stercorarius antarcticus*] *chilensis* Bonaparte, Consp. Gen. Avium, II, 1857, after October 1, p. 207; "ex Am. m." [= South America]). North American records of *Catharacta skua* from the Pacific Coast are found to be of this species. (*Cf.* Bent, Condor, XXIII, No. 3, June 3, 1921, pp. 78–80.)

Larus vegae Palmen becomes **Larus argentatus vegae** Palmen, because only subspecifically separable from *Larus argentatus*. (*Cf.* Hartert, Vögel paläarkt. Fauna, Heft XIII–XIV [Band II, 7–8], p. 1726.)

[1] Additions to the A. O. U. Check-List, the Sixteenth and Seventeenth Supplements, and the First to Sixth Annual Lists are marked with a dagger (†). Generic (and subgeneric) names so indicated do not now stand in these lists in either generic or subgeneric sense.

Larus leucopterus Faber becomes **Larus glaucoides** Meyer, because preoccupied by *Larus leucopterus* Vieillot, a synonym of *Larus hyperboreus;* and *Larus glaucoides* Meyer (in Meyer and Wolf's Taschenb. deutschen Vogelk., Zusätze und Bericht., III, 1822, after April, p. 197; "Meere der arktischen Zone, Z. B. in Island") is the next available name. (*Cf.* Mathews and Iredale, Austral Avian Record, IV, No. 6, August 1, 1921, pp. 155–156.)

Chroicocephalus franklinii (Richardson) becomes **Chroicocephalus pepixcan** (Wagler) (*Larus pepixcan* Wagler, Isis (von Oken), XV, Heft 5, May, 1831, col. 515; Mexico), because the latter name is of earlier date and of equal pertinence. (*Cf.* Mathews and Iredale, Austral Avian Record, IV, No. 6, August 1, 1921, p. 156.)

Gelochelidon nilotica (Gmelin) becomes **Gelochelidon nilotica aranea** (Wilson) (*Sterna aranea* Wilson, Amer. Ornith., VIII, 1814, p. 143, pl. LXXII, fig. 6; Cape May, New Jersey) by recognition of the American race as distinct. (*Cf.* Mathews and Iredale, Man. Birds Australia, I, 1821, p. 95; Hartert, Vögel paläarkt. Fauna, Heft XIII–XIV [Band II, 7–8], February, 1921, p. 1691.)

Sternula antillarum antillarum Lesson becomes **Sternula albifrons antillarum** Lesson, because only subspecifically different from *Sternula albifrons* (Pallas). (*Cf.* Hartert, Vögel paläarkt. Fauna, Heft XIII–XIV [Band II, 7–8], February, 1921, p. 1715.)

Sternula antillarum browni Mearns becomes **Sternula albifrons browni** Mearns, because only subspecifically different from *Sternula albifrons* (Pallas). (*Cf.* Hartert, Vögel paläarkt. Fauna, Heft XIII–XIV [Baud II, 7–8], February, 1921, p. 1715.)

† **Daption capense australis** Mathews. New subspecies. Mathews, Austral Avian Record, I, No. 8, March 20, 1913, p. 187 (New Zealand). The bird of this species recorded from California belongs to this Pacific Ocean race. Range: South Pacific Ocean.

† **Tadorna tadorna** (Linnaeus). *Anas tadorna* Linnaeus, Syst. Nat., ed. 10, I, 1758, p. 122 ("in Europae maritimis"). Recorded as North American from a specimen taken in Ipswich Bay off Annisquam, Mass. (*Cf.* Morse, Bull. Essex County Ornith. Club, [III], December, 1921, p. 68.)

Marila marila nearctica (Stejneger) becomes **Fulix marila nearctica** (Stejneger), by recognition of the genus *Fulex* Sundevall. (*Cf.* Oberholser, Proc. Indiana Acad. Science, for 1920 [1921], pp. 106–108.)

Marila affinis (Eyton) becomes **Fulix affinis** (Eyton), by recognition of the genus *Fulix* Sundevall. (*Cf.* Oberholser, Proc. Indiana Acad. Science, for 1920 [1921], pp. 106–108.)

† **Perissonetta** Oberholser. New genus. Oberholser, Proc. Indiana Acad. Science, for 1920 [October 1, 1921], p. 110; type by original designation and monotypy, *Anas collaris* Donovan. Thus *Marila*

collaris (Donovan) of the Check-List will become
Perissonetta collaris (Donovan).

Marila fuligula (Linnaeus) becomes **Fuligula fuligula** (Linnaeus), by recognition of the genus *Fuligula* Stephens. (*Cf.* Oberholser, Proc. Indiana Acad. Science, for 1920 [1921], p. 108.)

Marila ferina (Linnaeus) becomes **Aithyia ferina** (Linnaeus), by recognition of the genus *Aithyia* Gloger. (*Cf.* Oberholser, Proc. Indiana Acad. Science, for 1920 [1921], pp. 110–112.)

Gallinago delicata (Ord) becomes **Capella gallinago delicata** (Ord.) because only subspecifically different from the Old World *Capella gallinago* [and by reason of its change of generic name from *Gallinago* to *Capella*]. (*Cf.* Hartert, Hand-List Brit. Birds, 1912, p. 190; and Oberholser, THE AUK, XXXVIII, No. 1, January, 1921, p. 82.)

† **Limnocinclus** Gould, Handb. Birds Australia, II, 1865, p. 254; type, *Totanus acuminatus* Horsfield. Recognized as a genus to include *Pisobia acuminata* Horsfield. (*Cf.* Mathews and Iredale, Man. Birds Australia, I, 1921, p. 129.)

† **Neopisobia** Mathews. New subgenus. Mathews, Birds Australia, III, pt. 3, August 18, 1913, p. 245 (in text); type by original designation, "The bird described by Horsfield as *Totanus damacensis*" = *Pisobia ruficollis* (Pallas).

Calidris alba (Pallas) becomes **Crocethia alba rubida** (Gmelin) (*Charadrius rubidus* Gmelin, Syst. Nat., I, ii, 1789, p. 688; Hudson Bay, Canada) by recognition of the North American subspecies. (*Cf.* Mathews and Iredale, Man. Birds Australia, I, 1921, p. 134.)

† **Vetola** Mathews. Restored as a genus (*Cf.* Mathews and Iredale, Man. Birds Australia, I, 1921, p. 145). (*Cf.* also, THE AUK, XXXV, 1918, p. 204.)

Heteractitis brevipes (Vieillot) becomes **Heteroscelus incanus brevipes** (Vieillot), because considered only subspecifically distinct. (*Cf.* Hartert, Vögel paläarkt. Fauna, Heft XIII–XIV [Band II, 7–8], February, 1921, p. 1621.)

Arenaria interpres interpres (Linnaeus) becomes **Arenaria interpres oahuensis** (Bloxham), by revival of the Pacific subspecies. (*Cf.* Mathews and Iredale, Man. Birds Australia, I, 1921, p. 161.) (*Cf.* also THE AUK, XXXIV, 1917, p. 200.)

Haematopus bachmani Audubon becomes **Haematopus niger bachmani** Audubon, because considered only subspecifically different from *Haematopus niger* Temminck. (*Cf.* Hartert, Vögel paläarkt. Fauna, Heft XIII-XIV [Band II, 7–8], February, 1921, p. 1679.)

† **Dendragapus obscurus sitkensis** Swarth. New subspecies. Swarth, Condor, XXIII, No. 2, March 31, 1921, p. 59. Range: southeastern Alaska.

Lagopus rupestris (Gmelin) becomes **Lagopus mutus rupestris** (Gmelin), because only subspecifically different from *Lagopus mutus*

(Montin). (Cf. Hartert, Vögel paläarkt. Fauna, Heft XV [Band III, 1], April, 1921, p. 1871.) By this change all the North American subspecies of *Lagopus rupestris* become subspecies of *Lagopus mutus*, as follows:

Lagopus mutus rupestris (Gmelin).
Lagopus mutus reinhardi (Brehm).
Lagopus mutus nelsoni Stejneger.
Lagopus mutus atkhensis Turner.
Lagopus mutus townsendi Elliot.
Lagopus mutus chamberlaini Clark.
Lagopus mutus dixoni Grinnell.
Lagopus mutus kelloggae Grinnell.
Lagopus mutus sanfordi Bent.

Lagopus evermanni Elliot becomes **Lagopus mutus evermanni** Elliot, because only subspecifically distinct from *Lagopus mutus* (Montin). (*Cf.* Hartert, Vögel paläarkt. Fauna, Heft XV [Band III, 1], April, 1921, p. 1871.)

Lagopus welchi Brewster becomes **Lagopus mutus welchi** Brewster, because only subspecifically different from *Lagopus mutus* (Montin). (*Cf.* Hartert, Vögel paläarkt. Fauna, Heft XV [Band III, 1], April, 1921, p. 1871.)

Ortalis vetula mccalli (Baird) becomes **Ortalis vetula vetula** (Wagler) (*P[enelope]. vetula* Wagler, Isis [von Oken], XIV, Heft XI, November, 1830, col. 1112; ("Mexico" [subsequently restricted to neighborhood of the city of Vera Cruz, Mexico]), because not subspecifically separable. (*Cf.* Miller and Griscom, The Auk, XXXVIII, No. 1, January, 1921, pp. 44–46.)

Cathartes aura septentrionalis Wied becomes **Cathartes aura aura** Linnaeus, because the latter is considered to be the North American race. (*Cf.* Swann, Synopsis Accipitres, pt. 1, September 28, 1921, p. 3.)

† **Accipiter cooperii mexicanus** Swainson. *Accipiter Mexicanus* Swainson, Fauna Bor.-Amer., II, 1831 (February, 1832), p. 45, footnote ("Real del Monte [Hidalgo], Mexico"). Revived as a subspecies. (*Cf.* Swann, Synopsis Accipitres, pt. 1, September 28, 1921), p. 53. Range: western United States to Central America.

† **Crotophaga sulcirostris pallidula** Bangs and Penard. New subspecies. Bangs and Penard, Bull. Mus. Comp. Zoöl., XLIV, No. 4, January, 1921, p. 365 (San Jose del Cabo, Lower California). Range: southern Lower California.

† **Micropus pacificus** (Latham). *H[irundo]. pacifica* Latham, Index Ornith. Suppl., 1801, p. LVIII ("Nova Hollandia" [= Australia]). Recorded as North American from a specimen taken on St. George Island, Alaska. (*Cf.* Mailliard and Hanna, Condor, XXIII, No. 3, June 3, 1921, p. 93.)

† **Nuttallornis borealis majorinus** Bangs and Penard. New subspecies. Bangs and Penard, Proc. Biol. Soc. Wash., XXXIV, June 30, 1921, p. 90 ("Pine Flats, North Fork of San Gabriel River, Angeles County, California"). Range: western North America, south in winter to Peru.

Cyanocitta cristata cristata (Linnaeus) becomes **Cyanocitta cristata bromia** Oberholser, nom. nov. (*cf.* Oberholser, THE AUK, XXXVII, No. 1, January, 1921, pp. 86–89; "Wooster, Wayne County, Ohio"), because the name *Cyanocitta cristata cristata* applies to the Florida Blue Jay, *Cyanocitta cristata florincola* Coues.

Cyanocitta cristata florincola Coues becomes **Cyanocitta cristata cristata** (Linnaeus), because Blue Jays from Florida, the type locality of *Cyanocitta cristata florincola*, are subspecifically the same as *Cyanocitta cristata cristata*. (*Cf.* Oberholser, THE AUK, XXXVIII, No. 1, January, 1921, pp. 83–86.)

† **Thryospiza maritima juncicola** (Griscom and Nichols). New subspecies. *Passerherbulus maritimus juncicola* Griscom and Nichols, Proc. Linn. Soc. N. Y., XXXII, November 3, 1920, p. 25 (Goose Creek, Wakulla County, Florida). Range: vicinity of Goose Creek and St. Marks, Wakulla County, northern Florida.

† **Thryospiza maritima howelli** (Griscom and Nichols). New subspecies. *Passerherbulus maritimus howelli* Griscom and Nichols, Proc. Linn. Soc. N. Y., XXXII, November 3, 1920, p. 22 (Dauphine Island, Alabama). Range: breeds on coast of Alabama and Mississippi; winters to Texas and northern Florida.

† **Lanius excubitor mollis** Evermann. *Lanius mollis* Eversmann, Bull. Soc. Imp. Nat. Moscou, XXVI, No. IV, 1853, p. 498 ("Sudlichen Altai" [southern Altai Mts.]). Recorded from a specimen taken 260 miles west of Sitka, Alaska. (*Cf.* Mailliard and Hanna, Condor, XXIII, No. 3, June 3, 1921, p. 93.)

† **Dendroica auduboni memorabilis** Oberholser. New subspecies. Oberholser, Ohio Journ. Science, XXI, No. 7, June 6, 1921, p. 243 ("Ward, Boulder County, Colorado"). Range: breeds from Saskatchewan and Alberta to Arizona and Texas; winters south to Guatemala.

† **Motacilla lugens** Kittlitz. *Motacilla lugens* Kittlitz, Kupfertafeln zur Naturg. Vög., Heft 2, 1833, p. 16, pl. XXI, fig. 1 ("Kamtschatka"). Recorded as North American from a specimen taken in Alaska. (*Cf.* Thayer and Bangs, THE AUK, XXXVIII, No. 3, July, 1921, p. 460.)

Hylocichla guttata pallasii (Cabanis) becomes **Hylocichla guttata faxoni** Bangs and Penard, nom. nov. (*Cf.* Bangs and Penard, THE AUK XXXVIII, No. 3, July, 1921, p. 433; "Shelburne, N. Hampshire"), because the name *Hylocichla guttata pallasii* is a synonym of *Hylocichla guttata guttata* (Pallas).

REJECTIONS AND ELIMINATIONS[1]

Botaurus lentiginosus (Montagu) vs. **Botaurus stellaris lentiginosus** (Montagu). Proposed reduction to a subspecies (*cf.* Hartert, Hand-List Brit. Birds, 1912, p. 126) rejected. (*Cf.* Hartert et al., British Birds, IX, No. 1, June 1, 1915, p. 6; Oberholser, THE AUK, XXXVIII, No. 1, January, 1921, p. 80.)

* **Numenius americanus occidentalis** Woodhouse = *Numenius americanus* Bechstein. (*Cf.* Grinnell, Condor, XXIII, No. 1, February 5, 1921, pp. 21–27.)

GENERAL NOTES

Dovekie (Alle alle) at Newport, Me.—A Dovekie was picked up dead by Mr. Arthur E. Jordan in a field on his farm near Newport, Maine, late in December, 1921.—CARRIE E. MILLER, *Lewiston, Me.*

Iceland Gull at Elizabeth, N. J.—On a trip to the Elizabeth salt marshes, bordering Newark Bay on January 15, 1922, Mr. Ralph Friedman of Brooklyn and the writer saw at relatively close range—50 to 75 yards—a white gull resting on a mud flat with a small group of Herring Gulls. The bird was no larger, probably a little smaller, than the Herring Gulls. There was little difference in length, but the white bird had a slightly more slender body. The tip of the bill was noticeably dark. When first seen the plumage to both observers appeared uniformly white, though when seen after flight and at a greater distance through 8x glasses the feathers on the back of neck showed dirty white, slightly darker than the rest of the plumage. It seems safe to record the bird as an Iceland Gull (*Larus leucopterus*). On February 4, on Newark Bay, I saw two more of these birds in a very large flock of Herring Gulls and a few Ring-bills. One was apparently pure white and the other very dirty white though the primaries were pure white. Bills dark terminally. The latter was again seen on March 18.—CHARLES A. URNER, *Elizabeth, N. J.*

An Inland Record for the Man-o'-war-bird. In going over some old journals recently, I found a note which should have been recorded long ago.

On a visit to the Lone Tree Club, near Gladstone, Illinois, on October 10, 1903, I saw a mounted specimen of a Man-o'-war-bird. Inquiry revealed that the bird had been found in an exhausted condition on the Iowa bluffs

[1] Eliminations from the A. O. U. Check-List, the Sixteenth and Seventeenth Supplements, and the First to Sixth Annual Lists, are designated by an asterisk (*)

of the Mississippi, immediately south of Burlington, in August of the same year, and that although it had been fed, they had succeeded in keeping it alive for a few days only. I believe that this is the first Iowa record for the Man-o'-war-bird (*Fregata magnificens rothschildi*).—PAUL BARTSCH, *U. S. National Museum, Washington, D. C.*

Surf Scoters (Oidemia perspicillata) near St. Louis, Mo.—Surf, Scoters in juvenile dress have been taken in Missouri before this, but Mr. Steinwender of St. Louis took a male and female, probably a pair, in fine adult dress on November 19, 1921, on the Dardenne Club grounds, twenty-five miles northwest of St. Louis; Mr. Frank Schwarz of St. Louis mounted them.—O. WIDMANN, *St. Louis Mo.*

European Widegon (Mareca penelope) at Corpus Christi, Texas.—On December 20, 1921, Mr. Sidney T. Bixby of St. Louis shot from the yacht of Mr. Jos. Pulitzer, Jr., at Corpus Christi, Texas, a fine male European Widgeon. It was at first taken for a hybrid and has been mounted by Mr. F. Schwarz of St. Louis. More European Widgeons may be killed by hunters in North America than our records show, but considered hybrids they are not thought worth the trouble and expense of having them preserved.—O. WIDMANN, *St. Louis, Mo.*

Old-squaw (Clangula hyemalis) in Texas.—On December 13, 1921, I was asked to identify two Old-squaws which had been shot the day before near the town of Cove, some twenty-five or thirty miles from Houston, by two gunners from Dallas, Texas. They were apparently birds of the year and the sex was not determined. I failed to learn whether they were with others of the same species or alone. The bird is unknown to the local gunners.—ROBERT B. LAWRENCE, *Houston, Texas.*

An Enormous Flock of Canvas-backs (Marila valisineria) Visit the Detroit River.—On the morning of January 24, 1922, a big flock of canvasbacks (*Marila valisineria*) appeared on the Detroit River in the immediate vicinity of Belle Isle, the city park. Careful estimates by the observer and others placed the number of birds at about 1,000, and it was agreed that this number was more likely to have been an underestimate than otherwise.

Daily accessions to the ranks of the birds soon brought up the number to approximately 10,000, and these have remained in the waters about the island continuously until now, the last of February.

As the birds have been feeding very near the island, often within 50 feet of the shore, it has been easy to watch their methods. They dive in turn and about half of them are under the water at a time. When those that dive come up they bring roots of eel grass which they slap around violently until the root is broken into small pieces which they swallow and no piece is ever wasted, for if a small fragment starts away borne upon the current the duck retrieves it and eats it.

There seems to be no special reason why these birds should come here this year and particularly so early in the season. The winter has been mild and the river has remained open but often the winters are mild here, notably last winter which was even milder than the present season, yet my only record for Canvasbacks last spring was on March 19, when I saw a small flock of eight.

Old duck hunters with many years of experience say that they have never seen the Canvasback here in January and not often as early as the latter part of February; March being their usual time of migration, but Mrs. F. W. Robinson, of this city, a careful and faithful observer, says that seven or eight years ago during a very mild winter she saw a flock of several hundred of them on the Detroit River during the latter part of January.—Etta S. Wilson, *Detroit, Mich.*

The Greater Snow Goose in Massachusetts.—Three specimens of *Chen hyperborea nivalis* were shot in the Westfield Little River, not far from Westfield, Massachusets, on Thanksgiving Day, November 24, 1921. Two were immature with dark bills and feet, but the third was a mature bird. Unfortunately two of these geese, including the adult, were plucked and eaten before I learned of their being shot, and the third one was rescued while on the way for another dinner. This specimen, which has the rusty tinge about the head and neck, is now being mounted for the Springfield, Mass., Museum of Natural History.

Undoubtedly there was a very unusual flight of Snow Geese into this region about this time as a flock estimated to contain over one hundred birds was reported as seen in Southwich Ponds not far from Westfield. A single bird was also shot at Portland, Conn., one at East Windsor Hill, and a small flock noted at Glastonbury.

Mr. Robert O. Morris informs me that he observed a Snow Goose in the spring of 1887 in Longmeadow near the Connecticut River, a few miles below Springfield. His only other record of the bird dates back at least twenty-five years. It is of a Snow Goose wounded and captured in the vicinity of Springfield and kept for several years with a flock of domestic geese in the town of Southwick.—Aaron C. Bagg, *Holyoke, Mass.*

Notable Increase of Egrets in Chatham County, Georgia.—It is with much gratification that I am enabled to report a marked increase in the numbers of Egrets (*Casmerodius egretta*) breeding in Bird Pond, Ossabaw Island, Chatham County, Georgia. I first visited this pond in May 1905, devoting two days—May 11 and 14—to a study of the varied and abundant bird life which finds refuge there, nesting harmoniously in close proximity. At that time there were approximately a dozen pairs of Egrets breeding there (see Wilson Bulletin, March 1921, pp. 6–7). On April 30, 1921, I again visited this rookery, in company with Thos. D. Burleigh and J. T. Wheeler of the faculty of the University of Georgia. Besides making a very accurate count of the Egret population, we secured

much interesting data on the habits of the several species of water birds nesting in the pond. We found that the colony of Egrets had increased to thirty-four pairs, the contents of their nests being as follows: Nine contained young two or three days old; five held young a week or ten days old; one contained two pipped eggs; one held a single egg; four held two eggs each; ten contained three eggs each, incubation of which was far advanced, and a single nest contained four eggs.

The height of these nests varied from eight to twelve feet above the surface of the water which was three feet deep. Several of the larger willows supported four or five nests, while other trees held two and sometimes only one nest. Frequently, while climbing to the nests to examine their contents, a limb would give way beneath our weight, so frail and brittle are these trees, but we were always careful to avoid placing our entire weight on any limb supporting a nest.

In marked contrast to the behavior of these Egrets during my first visit to their rookery in 1915, when it was impossible to get within two hundred feet of them, was our experience with them in 1921. We were frequently allowed to approach to within a few yards of an adult standing on a limb near its nest, especially those birds whose eggs had hatched.

The pond in which this remnant of this beautiful and once abundant species breeds is not a natural one, but was formed and is maintained by the accumulation of water flowing from an artesian well. Should this well go dry—which, however, is very unlikely—these and all the hundreds of pairs of other species of herons which breed in the pond would be forced to seek other nesting places. These birds, especially the Egrets and Snowy Herons, are rigidly protected by the owners of the island, and, unless some unforeseen disaster should overtake them, will continue to increase steadily.—W. J. Erichsen, *2311 Barnard Street, Savannah, Ga.*

Nesting of the Bittern (Botaurus lentiginosus) in Philadelphia Co., Pa. In 'The Auk', 1918, p. 477, I recorded the discovery of a Bittern's nest at Woodbury Gloucester county N. J., in the Delaware Valley, and within ten miles of Philadelphia. This was the first definite nesting record of this species in this region where it seems to be a rare breeder. On May 31, 1921, I found a nest containing five eggs at Bridesburg, Philadelphia, on the Delaware River marshes, within five miles of the City Hall. The female was flushed from the nest and let me approach within two yards before vacating. The nest was in a patch of wide-leaved cattail in a large marsh, within a few yards of a railroad, less than a quarter of a mile from a foundry and still nearer to a shipyard. This is the only record of the nesting of the Bittern on the Pennsylvania side of the river, and one of the few records for the State.—Richard F. Miller, *Philadelphia, Pa.*

A Connecticut Record of the Stilt Sandpiper.—The Stilt Sandpiper (*Micropalama himantopus*) is not often recorded from Connecticut in

either spring or fall. For that reason I wish to put on record a bird observed by myself at Great Marsh, Westport, Conn., on May 28, 1921. The tide was low at the time, and the bird was found standing in the tall sedges that grow between low and high water. It allowed me to approach very closely and to make out all of its markings and characteristics save the long legs which were hidden in the grass, and did not show to advantage when the bird finally flew. While I have never before seen this species, the markings tallied in every way with those of the Stilt Sandpiper in spring plumage, and I have no doubt of its correct identification.—ARETAS A. SAUNDERS, *Fairfield, Conn.*

The European Gray Partridge in Saskatchewan.—During the first week in November, a bird was sent in from Rutland, Sask., to the University of Saskatchewan for identification. It was the Gray Partridge of Europe, here called the Hungarian Partridge. It has been mounted for the University Museum.

I have gathered the following information about the bird:

Mr. Russell Martin, who sent the specimen in states:

"I saw a flock of from 15 to 20 of these birds at the edge of a wheat field, about the first of September and about the first of November picked this one up from beside the road three miles from where I saw the flock. It had apparently been killed by flying against a telephone wire. This is a hilly, rough country with considerable brush and sloughs or pot holes. About half the land is farmed."

Mr. Benj. Lawton, Chief Game Guardian of Alberta, notes under date of November 30, 1921: "There is no doubt in my mind but that these birds are the natural increase of a number of pairs which were turned loose by the sportsmen of Calgary about the year 1910. They have spread all over the southern half of the Province of Alberta and have got as far as Edmonton. They are very prolific

"There were two importations, one I believe in the spring of 1910, and the other in the spring of 1911. There have been no importations since the outbreak of the war

"The open season in this Province is for the whole month of October, with a bag limit of 10 birds for the day and 50 for the season."

Mr. F. Bradshaw, Chief Game Guardian of Saskatchewan, wrote from Regina, Sask., Dec. 1, 1921: "I have no previous authentic information on file regarding this bird being observed in Saskatchewan, but under date of November 23rd, I received a letter from Mr. G. H. Coulter, Box 5, Piapot, in which he states that he had, 'seen some small birds around here this fall, thought they were quail. Have been told that they are Hungarian partridge from Alberta. They flush all together, and run on the ground.'

"It would appear that these birds are extending their range, and have now crossed the Alberta boundary, and I have asked Mr. Coulter to keep the birds in his district under observation, and advise us from time to time how they are getting along."

Piapot, Sask., is 68 miles north of the U. S. boundary, and 40 miles east of the Alberta boundary. It is less than five miles south of Crane Lake. Rutland, Sask., is 174 miles farther north, and is twenty miles from the Alberta boundary.

It would be interesting, if the information is available, to know whether they have yet appeared in Montana.—JOHN SMITH DEXTER, *Saskatoon, Sask.*

Early Nesting of the Mourning Dove.—In the spring of 1921, Mourning Doves (*Zenaidura macroura carolinensis*) returned from the south unusually early. I saw one bird at Fairfield, Conn., on February 5. This may have been a wintering bird, but by March 12 several birds were seen or heard cooing, and the species seemed to be fully as abundant as in summer. On the first day of April, while crossing a dense grove of tall red cedars I saw a bird fly from a stick nest about ten feet up in a cedar. On climbing to the nest I found the usual two eggs, apparently quite fresh.

I visited this nest a number of times, and up to April 10 everything was all right, but on April 20, my next visit after that date, the nest was empty. The earliest previous date for nesting of this species in Connecticut is April 29, 1894 ('Birds of Connecticut,' p. 73) and dates of earliest nesting from other localities indicate that this nest was earlier than is normal with the species.—ARETAS A. SAUNDERS, *Fairfield, Conn.*

On the Nesting of Ectopistes migratorius—The following letter from Mr. Charles Douglas, the veteran ornithologist of Waukegan, Illinois, is interesting from the fact that his observations can be absolutely relied on: "I was glad to learn today that you had taken up the nesting of the Passenger Pigeon, the number of eggs they laid, etc. From articles I have read from time to time, that Wild Pigeons laid two eggs or one egg is a question that puzzled me. In my time I have found and examined twelve to fifteen Wild Pigeons' nests on most of which the old bird was sitting, but never found in any of them more than one egg, and it always seemed strange to me that so many nests could be found without more than one, if they ever lay more.

"You know the nests in this locality were few and only one pair of birds to each nest. It may be possible that in big pigeon roosts, more than one bird laid in the same nest, where they were crowded, as was the case in northern Michigan. All the nests I found were in the same place each year, and in groups of three or four, not many rods apart, in the big pines near the Lake at Beach (a mile North of Waukegan), and in a small hard-wood grove about a mile west.

"In the spring the birds fed on the wild raspberries, and in the summer came into the garden and ate the cherries. At this time of the year we did not disturb them. All is changed now; a week ago, when I sat by a fire on one of the old decaying pine logs, one of the few left of the old

nesting places, my thoughts wandered back over the dear old times and companions of years ago. I often go to the favorite old places to live it all over again."—HENRY K. COALE, *Highland Park, Ill.*

Notes on Ectopistes migratorius.—Along in the sixties and early seventies, when millions of Passenger Pigeons made their yearly pilgrimage to their northern Michigan and Wisconsin breeding grounds, a man by the name of Tom Stagg made a business of supplying live Pigeons for trap shooting matches. He owned forty acres, a house and large barn at the north-west limits of Chicago (now Fullerton and Diversy Avenues).

The outside sheeting of the barn was removed and the sides latticed with laths, making the building one huge cage. With an assistant, Byron E. Clarke, who is still living at Hinsdale (a suburb of Chicago), he made regular trips to the Pigeon roosts near Muskegan, Michigan, and Portage, Wisconsin, to get live birds for the shooting matches.

The Pigeons were in such great flocks that they covered all the branches of the pine trees, and by going among them at night, they could be taken by hand from the lower branches by hundreds. They were dropped into bags, and transferred into crates and shipped. At times Mr. Stagg had as many as 5000 or more in his big cage. He provided watering troughs and feed before re-shipping to his customers, the average price being $1.25 a dozen.

When the Pigeons were put into this huge cage they were so thirsty, that many drank themselves to death, or were killed in the mad scramble for water. In 1876 R. A. Turtle (now a taxidermist in Chicago) took 3500 Passenger Pigeons in crates to the annual live pigeon shoot in New York, which was run by Greene Smith, who was known to many of the older A. O. U. members, when he accumulated a large collection of birds at his home in Peterboro, N. Y. When this shipment reached its destination, most of the birds had worn the skin and feathers off the top of their heads from contact with the crates.

There was also the Abe Kleimann trap grounds near Chicago, where thousands of the Pigeons were shot. The writer, George Clingman and Joseph Hancock (still living) picked up dozens of wounded birds, which fell outside the fence. Mr. Clingman recently gave his fine collection of mounted birds to the Bryn Mawr High School of Chicago.—HENRY K. COALE, *Highland Park, Ill.*

Economic Status of Coragyps urubu in British Guiana.—When I was in Georgetown, during the winter of 1920–21, the Black Vulture was one of the commonest birds about the city. It was an everyday experience to see them sitting in rows on the roofs of houses, while the public abbatoir, within the harbor, rarely had less than 30 or 40 about the buildings, apparently on the lookout for slaughter-house offal. Now one gets only a distant glimpse of occasional individuals flying high in air; at least nine-tenths of these municipal scavengers have disappeared, and I have not yet noticed a single bird roosting on a ridgepole.

Until 1921, attempts made by the Government Health Department to organize a campaign against these "carrion crows" failed, owing to local prejudice, although the birds were said to be a source of serious pollution of the drinking water, largely supplied by roof drainage in this region of torrential rains. Last year, as I was leaving the colony, I learned that an ordinance had finally passed the town council authorizing the shooting of the vultures by the police. To what extent this law has meantime been carried out I am unable to say, but a great many "crows" were undoubtedly killed and (probably) many more frightened away, to become denizens of the country districts where, in the absence of a regular system of carrion disposal, they will, without doubt, be of definite value as scavengers.

Although the agitation for the removal of the Black Vultures did not result in their immediate destruction, yet the public were to some extent convinced that they were a source of filth, and perhaps of disease, through defilement of the water supply. As a consequence, quite a number of buildings were "protected" from contamination by means of various devices.

The most common scheme was that of affixing an upright of serrated iron, or several strands of wire supported at intervals of three or four feet, along the whole length of the ridgepole, so that the vultures could not alight or roost upon it.

Analyses of the cistern water collected from effectively "protected" roofs proved the wisdom of this precaution, as it was found to be uniformly free from pathogenic bacteria, while reservoirs filled from "unprotected" roof-areas (and especially those known to be patronized by carrion crows) were often shown to be infected by morbific germs.

The Government Medical Officer of Health, Dr. E. P. Minett, informs me that while the rain water used by the European residents in the colony is generally boiled before use, it is doubtful if this precaution can be relied upon as carried out by native cooks, and the danger of infection is a very real one where carrion crows abound, as these filthy birds have been shown to communicate pathogenic bacteria to the water supplies by their habits of carrying filth to the roof; also, their feces have been proved to contain purulent pathogenic microbes. Many analyses carried out by the Department on the excrement of these vultures demonstrate that they are fully endowed with polluting powers, and from their habits and situation freely exercise them. Although something may be said in their favor as scavageners in extra-urban localities, their presence in a city of 60,000 inhabitants, with an organized health department boasting a lage sanitary staff, is as unnecessary as it is dangerous. It is recognized that to make the movement continuously successful it may be necessary to repeat the vulturine holocaust, lest there be a return of the birds from their country resorts.—Casey A. Wood, *Georgetown, Brit. Guiana.*

Snowy Owl at Elizabeth, N. J.—On January 2, on information received from Dr. Wm. B. Ley, of this city, I located a Snowy Owl (*Nyctea nyctea*) on the salt marsh near Elizabeth, and near the shore of Newark Bay. I learned from hunters that the bird had been first seen in that locality on December 26. I found it sitting among the uneven ice chunks left by the receding tide and its plumage blended so perfectly with its surroundings that I might easily have failed to notice it had I not been on the lookout. I got within about seventy yards before the bird took flight and after being disturbed it would not again allow so close an approach. When first seen its posture was vertical, the usual owl pose, but when it lit upon the open ice after being disturbed the body and tail were held horizontal to the ground plane with head erect, this possibly being a usual attitude when the bird is on the alert.

I saw the bird again on January 15 and 22 and March 18, but on neither of these occasions did he assume the horizontal pose, his posture being upright or leaning slightly forward.

Owls have been present in unusual numbers here this winter. My list included weekly from December 4 to January 8 a single Barn Owl (*Aluco pratincola*), always found roosting in the same tree, and a Saw-whet Owl (*Nyctala acadica*) found December 11, while Short-eared Owls (*Asio accipitrinis*) on the salt marshes and Long-eared Owls (*Asio wilsonianus*) in the neighboring nursery evergreen groves have been quite common. —Charles A. Urner, *Elizabeth, N. Y.*

Nesting of the Long-eared Owl in Southern New Jersey.—It is a well-known fact that the Long-eared Owl is a rare breeder in south Jersey, hence the discovery of two nests is worthy of record. Both nests were found by my friend H. M. Harrison, while we were, together with T. E. McMullen, ferreting out the nests of our hawks and owls. They were both found near Pennsgrove, in Salem County, N. J. The first nest held four slightly incubated eggs and was found on April 10, 1921. It was about 25 feet up in a pin oak tree in a thicket of oaks of small size covering about four acres; the female was on the nest. The other nest contained five pipped eggs and was examined on April 17, 1921; it was about 25 feet up in a Jersey pine tree, a few yards within a large thicket of pine and oak trees of small size. Both birds were upon the nest. With the exception of nests found by W. B. Crispin and R. T. Moore, these are the only Long-eared Owl's nests known to us from south Jersey.—Richard F. Miller, *Philadelphia, Pa.*

Hawk Migration Route at Whitefish Point, Upper Peninsula of Michigan.—The line of greatest hawk migration between the eastern portion of the Upper Peninsula of Michigan and Canada is at Whitefish Point. This point lies between the eastern end of the open waters of Lake Superior and Whitefish Bay, about 40 miles Northwest from Sault Ste. Marie, and is about 20 miles distant from the Canadian shore. Every

year thousands of hawks take this route but are far more plentiful in spring than fall.

In the spring the bulk of the larger hawks arrive a week or so ahead of the smaller hawks. In the fall few of the smaller hawks use this route and the number of the larger hawks is perceptibly less than in spring.

Usually the flight does not begin until April 15. This spring it was unusually early, starting the latter part of March and hundreds were flying by April 1.

The spring flight is on only when the wind is from the South and at its best after the wind has been from that direction for several days.

The bill allowing 50 cents bounty per hawk was repealed at the last session of the Michigan Legislature, taking effect August 18, so hereafter the spring slaughter of hawks at the Point will not take place. The bounty was paid on 2305 Hawks in this county last spring, of this number 2007 were shot at Whitefish Point. One man shot 254 last spring, 51 in one day, and during the flight in spring of 1920, 563, 60 in one day.

Hawks shot this spring were Goshawk (*Astur atricapillus atricapillus*), Pigeon Hawk (*Falco columbarius columbarius*), Marsh Hawk (*Circus hudsonius*), Osprey (*Pandion haliaetus carolinensis*), Cooper's Hawk (*Accipiter cooperi*), Red-tailed Hawk (*Buteo borealis borealis*), Rough legged Hawk (*Archibuteo lagopus sancti-johannis*) and Sparrow Hawk (*Falco sparverius sparverius*).

In addition to the above several other species were shot but not identified.

One of the shooters reported to me that on April 5, mistaking it for a big black hawk as it came low over the tree tops, he shot a Turkey Buzzard (*Cathartes aura septentrionalis*). He also reported that about a week later he saw another Buzzard but recognized it in time not to shoot it. Six or seven years ago this man's brother saw two Buzzards during the spring hawk flight in the same locality.

The above would indicate that now and then the Buzzard crosses into Canada. In fact one was reported taken at Moose Factory, James Bay, about 300 miles north of the Soo in 1898. (See Auk XX, p. 66)—M. J. MAGEE, *Sault Ste. Marie, Michigan.*

Golden Eagle (Aquila chrysaetos) and Porcupine.—While living at Aitkin, Minnesota, in the latter part of November 1900, a woodman brought to me a Golden Eagle which he had found. It was hardly able to walk and it was easy for him to kill it by beating it on the head with a club, putting the poor creature out of its misery. The bird had evidently aimed to make a meal of a porcupine for it was literally covered underneath with quills. In fact, there were a number of quills in the roof of its mouth. My first thought was that its eyes might have been injured but upon examination I found them perfect. During all of October and the first part of November the weather was rather mild and the ground bare of snow and it could not have been for a scarcity of food that the attack was made on the porcupine. It is, therefore, difficult to understand why

it should make so serious a mistake. The bird, no doubt, had been without food for sometime as the body was very much emaciated and many of the quills had penetrated deep into the flesh causing puss to form. It would have been an interesting study specimen if the skin could have been preserved without removing any of the quills but that was impossible as most of them had to be extracted with a pair of pinchers in order to skin it. The specimen is now in the collection of the late Mr. R. D. Hoyt, Seven Oaks, Florida.—ALBERT LANO, *Fayetteville, Arkansas.*

The Whistled Call of the Hairy Woodpecker.— On January 9, 1922, at 4:15 p. m. I visited my bird trapping station, and discovered that I had captured a male Hairy Woodpecker. For some reason, or other, all species of woodpeckers, that I have caught, seem to be unable to find the exit into the back part of the trap, unless assisted. This individual seemed to be no exception, as he was rushing back and forth, vainly seeking a means of escape, and as I approached he climbed upon the sides of the trap and hung there.

I immediately knelt down beside the trap and began rapping on the sides, this was the only way I could make him loosen his hold, and go into the other part so I could release him. It was of no avail, and finally becoming tired of my position, I arose to my feet. At the same time I was somewhat startled by a loud, piercing, *quavering* whistle. At first I thought it was a whistle blown by some child; I looked out toward the street, but there were no children in sight. Then it came again, loud, clear and decidedly unfamiliar. This time however, I realized that it was a bird call, and examined the surrounding trees. Chickadees were the only birds in sight and I knew that they were quite incapable of making such a sound. The thought that the Hairy Woodpecker was the whistler, never, for a moment entered my mind. For, strangely enough, the sound did not seem to come from the trap, there was an odd ventriloqual quality about it that I cannot describe.

I finally gave up trying to solve the problem, and again turned my attention to my captive, he was still energetically seeking a means of escape. I knelt beside the trap again, and began tapping on it. Again came the odd *quavering* whistle, and it was with a real thrill that I made the discovery that it was the Hairy Woodpecker, after all, that had been calling in this strange manner. He continued to whistle until I succeeded in driving him into the other compartment.

While I was adjusting the band he struggled violently, pecking savagely at my hands and at the band, and every few moments whistling shrilly. Taking the bird's actions into consideration, one might be led to the supposition that this was a cry of anger, for there is no doubt about it, the bird seemed very resentful from the time I discovered him until he was released.

I examined all the bird books in my possession to find an account of

this particular cry, but was unable to find any record of it, I then wrote to the Biological Survey, Washington, and Mr Henderson replied, saying that it was a call known to a very few ornithologists.

All of the male Hairy Woodpeckers that I have banded or have observed, answer Dr. Chapman's description, in that they have the scarlet band on the nape. This individual was an exception, the band was *white*, and in the center of the back of the head were two oval red spots, so accurately and perfectly proportioned, that they seemed to have been painted there. These were separated by a fine black line.—KATHLEEN M. HEMPEL, *Elkader, Iowa.*

Two Interesting Occurrences of the Alder Flycatcher in Erie County, N. Y.—The Alder Flycatcher (*Empidonax trailli alnorum*) has always been considered a rare, or at least uncommon, breeder in this general locality. During the ten years prior to 1921, I failed to meet with a single pair, and I can not believe that the peculiar "song" of this bird would pass unnoticed. And yet, during the nesting season of 1921, I found two singing Flycatchers, both in characteristic locations, near Hamburg. Presumably, two pairs were breeding but, although a careful search was made in each case, neither nest was discovered.

The first bird was seen May 30, in a small swamp at the very edge of the uplands south of the village, within a mile or two of nesting Juncos (*Junco hyemalis hyemalis*) and Blackburnian Warblers (*Dendroica fusca*). The "song," as I heard it, was the dissyllabic "grea'-deal," as written by De Witt Miller, and quoted by Eaton in his 'Birds of New York.' The accent was on the "deal." The bird sang frequently, each utterance being accompanied by a noticeable swelling of the throat and a sudden upward jerk of the head.

A second visit was paid to this locality on June 5. The bird was found in the same place and was still singing at frequent intervals. However, on June 12, the date of my final observation, the Alder appeared to be much more quiet and was located only with considerable difficulty.

On June 18, while passing through a somewhat larger swamp on the lowlands north of Hamburg, I was surprised to hear a familiar "grea'-deal," and lost no time in locating another Flycatcher. This bird did not sing at all frequently, however, and might easily have been overlooked. The swamp also proved to be the home of a pair of Virginia Rails (*Rallus virginianus*), two pairs of Swamp Sparrows (*Melospiza georgiana*) and at least two pairs of Veeries (*Hylocichla fuscescens fuscescens*). Unfortunately, I was unable to revisit the locality until July 10, at which time the Alder Flycatcher could not be found.

My experience this year leads me to think that the Alder Flycatcher may be a more common summer resident in this general area than our present records would indicate. If suitable locations are carefully watched during May and early June, the bird may be found to be a regular breeder, although the pairs will be few in number and very locally distributed by reason of the choice of habitat.

Prior to the present year, my personal records contained spring and early fall migration dates only for this subspecies and these dates were comparatively few in number. Moreover, I had never heard its notes, as the transients seen were invariably silent. The notes and habits of Traill's Flycatcher *Empidonax traillii traillii*, however, were familiar to me, as I had found this form fairly common along Smith River, in Douglas County, Oregon, during the early summer of 1914.—THOMAS L. BOUCHER, *Hamburg, New York.*

An Albino King Bird at Prouts Neck, Maine.—On September 1, 2 and 3, 1921, I saw an albino Kingbird *Tyrannus tyrannus*, in front of our cottage. The bird was pure white, save for a faint wash of gray on the outer tail coverts. There were five or six other Kingbirds in the flock, and they alighted on telegraph wires, and took short flights to the rocks on the beach. I believe the bird was also seen in Yarmouth, Me.—WM. PEARCE COUES, M.D., *Brookline, Mass.*

The White-Necked Raven (Corvus cryptoleucus) in Boulder County, Colorado.—On December 21, 1921, I noted the White-necked Raven in scrubby trees along the foothills two miles south of Boulder. Two individuals were studied with good field glasses at a distance of twelve paces. Cooke states that R. A. Campbell noted the species here in 1894. So far as I can determine this is the last authentic record of the occurrence of the White-necked Raven in Colorado previous to this year. However Mr. Aiken states that in some sections of the state it was the commonest species of *Corvus* in 1871–2, and that a nest with seven eggs was found sixty miles east of Colorado Springs in 1878.—THEODORE R. BEARD, *1026 Univ. Ave., Boulder, Colo.*

Magpies, at Emmetsburg, Iowa.—On November 14, a man described to me a bird that I took to be the Magpie. Inside of a week this bird was reported to me by five different persons. Then, on November 25, it was reported by one who had known the bird in the northwest. On December 5 I saw two myself. On December 9 a man brought one to my study, which he had found caught in a mink trap. On December 12 I saw another; and that night a man brought one to me that he had shot. This one I have sent to the Department of Ornithology, State University of Iowa, to be mounted. I find, by conversing with duck hunters, that this bird is becoming rather common hereabout. I have been here seven years; have been an inveterate tramp; have made careful records of arrival and departure of birds, both spring and fall, and have never before seen the Magpie, nor heard of its being here.—LEROY TITUS WEEKS, *American School of Wild Life, Emmetsburg, Iowa.*

Starlings Nesting at Syracuse, N. Y.—While the Starling (*Sturnus vulgaris*) has been recorded in the vicinity of Syracuse since June 1919, no nests have been found so far as I have been able to learn. The

few reports of the occurrence of the starling in Onondaga County have referred to straggling individuals, a part of the advance guard from the lower portions of the state perhaps.

On April 25, 1921, Mr. Neil Hotchkiss and I discovered a Starling's nest near the lower end of Onondaga Lake. It was located in a dead tree which was hollow for a greater part of its length, and which was a rendezvous for a number of nesting Tree Swallows and English Sparrows. The tree was standing on the bank of the outlet to the lake and, as the water was high, the base was submerged. This prevented our examining the nest itself but we observed the birds at close range for some little time.

We reported the discovery to the Onondaga County Bird Club, of which we are members, and later the other members of the club visited the locality and verified our report. This is the first nest to be found in Onondaga County according to the records of the club, and we thought that it would be of interest to some of the readers of 'The Auk'.—FRANKLIN H. MAY, *Syracuse, N. Y.*

Evening Grosbeak at Stroudsburg, Pa.—Thinking it might be a matter of interest I want to report the presence here this month (December) of Evening Grosbeaks (*Hesperiphona vespertina vespertina*).

This bird has been a frequent visitor in these parts for a number of years though my first acquaintance with it in a personal way did not occur until the spring of 1919.

In my bird journal under date of April 22, 1919, I have noted "Three Evening Grosbeaks." My attention was drawn to their peeping note resembling somewhat the "peeper" frog. Their large size with yellow black and white in their plumage and the big conical bill or beak which at a distance looked white were the field marks by which I identified them. On April 26, 1919, a cold raw morning, I came across a flock of about 15, feeding on the seeds or "keys" of the Ash-leafed Maple or Box Elder.

In my bird journal for 1920 I do not find any record of their presence and I do not recall seeing them.

On a bright cold morning December 13, 1921, about 11 o'clock I was attracted to a large flock numbering at least 30 some of which settled on the tin roof of a porch across the street from where I was standing. For some reason they had been driven apparently from some Ash-leafed Maples where they had been feeding. I had a fine opportunity to see them close at hand. The next day December 14, I found another flock, possibly the same, feeding in a large Ash-leafed Maple in a yard near where I saw them the day before.

Again on Thursday morning December 29, I saw another large flock flying over, a few settling in a tree very near the same spot as reported above.

The Ash-leafed Maple or Box Elder is quite plentiful in this section both as a shade tree and in a wild state.

Knowing of the bird as a rather rare winter visitant in these parts or rather in this section of the United States, I thought possibly you might be interested in a report of their presence in Stroudsburg, Monroe County, four miles north of the Deleware Water Gap and about fifteen miles from the Poconos.—HERBERT W. WESTWOOD, *Stroudsburg, Pa.*

Evening Grosbeaks in Pike Co., Pa.—Shortly after noon on December 17, 1921, a flock of fifteen or twenty Evening Grosbeaks were under observation in Bushkill, Pa., for at least ten minutes. In previous years they have frequented the large shade trees in the village for weeks at a time but this year they seem to have ranged more widely as no more were seen until January 10, 1922, when a flock of similar size, probably the same birds, were noted in the vicinity of Coolbaugh, about five miles distant.—EDWIN B. BARTRAM, *Bushkill, Pa.*

White-throated Sparrow Summering in Autauga County, Alabama.—On June 19, 1921, while investigating a nest of the White-eyed Vireo on the edge of Pine Creek Swamp, two and a half miles from Prattville, I noticed a peculiar looking bird in the flock of Kentucky Warblers, Hooded Warblers, Wood Thrushes and other birds that came in response to the distress calls of the Vireo. I followed this bird into a blackberry patch and identified it as female White-throated Sparrow (*Zonotrichia albicollis*) and from the shaking and picking of its feathers I took it to be an incubating bird. A most determined search failed to reveal nest. On June 23, the same thing happened again; the same bird flitting from bush to brier and then on to the ground; allowing an approach to within six feet repeatedly. The male was observed on June 26, sixty or seventy feet south of where the female had been observed, keeping entirely to the ground scratching and picking most industriously. No female seen this time.

June 30, the female was seen at the same place and the male heard fifty or sixty feet south in trees twenty-five or thirty feet up.—LEWIS S. GOLSAN, *Prattville, Ala.*

Tree Sparrow (Spizella monticola monticola) in Georgia.—While spending a week or two in Augusta, Georgia, I discovered on February 25, 1921, three Tree Sparrows feeding on one of the lawns of that city. I am well acquainted with the "winter chippy," a dozen or two of whom spend part of each winter in our garden or vicinity. The dusky spot on the gray breast, the brown cap and whitish wingbars were unmistakable and the trio allowed me to come within 15–20 feet of them with the binoculars. At the time I did not realize that this was an unusual observation but all authorities which I have since consulted give South Carolina as the limit of their southern range. To be sure this is only across the Savannah river from that State, but I believe it constitutes a new record. Dr. Eugene Murphy of that city subsequently told me that he has long been

of the opinion that Tree Sparrows occasionally visit his vicinity, but in his years of collecting he has not succeeded in recording any.—AARON C. BAGG, *Holyoke, Mass.*

The Nesting of Henslow's Sparrow in Southern Connecticut.—On May 19, 1921, while observing the migration, then at its height, I found a male Henslow's Sparrow (*Passerherbulus henslowi henslowi*). The bird was in a field near the Hemlock's Reservoir, Fairfield, Conn. At the time I was in the company of five others, Mr. and Mrs. Geo. Waldo of Bridgeport, Mr. and Mrs. L. F. Glynn of Fairfield, and Mr. Frank Novack of the Fairfield Bird Sanctuary. All of us observed the bird from a very short distance and in a clear light. I was first attracted to it by the song, the short one that has been written "fleezick." To me it sounded more like "tililip." I made a record of it, which, unless one considers a single "chebec" of the least Flycatcher a song, is the shortest bird song I have recorded, occupying but two-fifths of a second.

The bird was not in the sort of locality in which it is usually described as nesting, so that no thought of a possible nest entered my head at the time. Returning to this area alone on June 4, 1920, I found the bird still there, so that the possibility of finding its nest occurred to me. The area had been the usual typical dry field, with sweet vernal grass (*Anthoxanthum odoratum*) and the common white daisy (*Leucanthemum vulgare*) the most conspicuous forms of vegetation at that season. The Bridgeport Hydraulic Company, however had planted the area, a few years ago, with white pine (*Pinus strobus*). These trees had reached a height of two to four feet, and the bird was first found singing in their tops. Hunting about not far from the tree in which the male sang, I heard a slight sparrow "tsip." I should ordinarily have passed the note for that of a Field Sparrow, but being on the lookout for Henslow's Sparrow I thought I detected a slightly different quality in the note, and soon found it a second Henslow's Sparrow, evidently the female, for the male was still singing where I had first observed him.

I sat down to watch this bird, and waited for nearly an hour. The bird was evidently disturbed at my presence, and kept up a continual "tsipping," balancing herself in the top of a pine, and facing a strong wind that was blowing so hard as to almost unseat her. Little by little she approached a spot about which my suspicions centered, and finally ceased her "tsip" and dropped to the ground. I went to the spot and found the nest, with four young birds, so well grown that they left at my approach, and I was only able to catch one. This bird was essentially like its parents in most particulars, but had a pale gray colored down adhering to the feathers of the head and upper back. The down was so light in color that it may have been white when the birds were first hatched.

The nest was in a hollow of the grass on the ground. It was not under one of the pines, as I had rather expected it would be, but was more than

two feet from the nearest pine. It was made entirely of grasses, those of the lining finer than the others. On the south side it was roughly arched, like the nest of a Grasshopper Sparrow, but so crudely that I did not feel sure whether the birds had actually constructed the arch, or only built the nest in the shelter of a tuft of dead grass that already happened to be there.

The young were evidently expert at hiding in the grass, for after releasing the bird I had caught I could neither find it again, nor any of the other three birds. This is my first experience with this species, though farther north in Connecticut it is reported locally to be common. On my two visits the male sang only the short song, so that I have yet to hear the longer song described for this species.—ARETAS A. SAUNDERS, *Fairfield, Conn.*

Albinism in the Sharp-tailed Sparrow (Passerherbulus caudacutus).—In 'The Auk' for October, 1921, pp. 604–605 I have a note under the above caption.

On December 16, 1921, I visited the place for the first time this season where I have recorded so many albinistic Sharp-tailed Sparrows. A short search among the multitudes of Sharp-tail, Acadian, Nelson's and Seaside Sparrows revealed the presence of two albinistic Sharp-tails, one with a pure white tail-feather and the other a mottled bird with white also in wing and tail-feathers. I went again to the place on December 31, and seeing again the two albinistic birds, shot the mottled example. This one, like all the others recorded has the abdominal and ventral region profusely spotted with black. This makes an uninterrupted strain of albinism for twenty-two years.—ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

An Albino Swamp Sparrow (Melospiza georgiana).—On December 8, 1921, while collecting in a large field of broom grass in search of Leconte's Sparrow (*Passerherbulus lecontei*) I saw a pure white sparrow among a flock of Swamp, Song and White-throated Sparrows. By its flight I could readily identify it as a Swamp Sparrow and when I secured it I found that I had made no mistake. This bird was exceedingly shy and I flushed it repeatedly before I finally procured the specimen. It is entirely pure white with the exception of one normal rectrix, which is concealed by the other feathers overlapping it and another normal scapular feather. It is an adult male and was very fat.—ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

Note on the Philadelphia Vireo (Vireosylva philadelphica).—In a recent note (Auk, Vol. XXXVIII, No. 4, p. 607) Mr. H. Mousley comments on the absence from my paper 'A Nesting of the Philadelphia Vireo' (Auk, Vol. XXXVIII, No. 2, p. 202) of any reference to his published records of the species. The absence of any such reference is due to the fact that it was in October, 1919, (Auk, Vol. XXXVI, No. 4, p. 486) that Mr. Mousley's first record of this species was published, while

it was in August, 1919, that my paper was accepted for publication in 'The Auk'.

In the same note Mr. Mousley says: "It will be noticed that with one exception all the birds seen by me were in the fall of 1919, the year they bred at Bergerville." Philadelphia Vireos bred at Bergerville, P. Q., in 1920 also, for on July 11 of that year I found a nest of this species containing young birds in a white birch in dense woods near my residence. After the young had flown I secured this nest, which was 38 feet from the ground and 8 feet from the top of the tree, and presented it to Mr. Mousley with relative data. I was not resident at Bergerville in the summer of 1921, but, in the absence of further evidence, there appears to be no ground for supposing that the breeding of Philadelphia Vireos in that neighborhood is sporadic.

Mr. Hoyes Lloyd has kindly called my attention to an error in the closing sentence of my paper above referred to. In the next to the last line of text on page 202 of 'The Auk,' Vol. XXXVIII, No. 2, for "Brewster" substitute "Dwight," with the reference " 'The Auk', XIV, pp. 259–272. July, 1897."—HARRISON F. LEWIS, *92 Argyle Ave., Ottawa, Ont.*

Golden-winged Warbler Nesting at Waterford, N. Y. — Although the Golden-winged Warbler has a record of being seen only once in Saratoga county, N. Y., it is really a common breeder in the south-east corner of the county. Ten pairs nest in a small ravine two miles north of Waterford in that township. Several pairs nest in a larger ravine four miles north of Waterford. They arrive May 15, and are common as migrants until May 3. This warbler also nests two miles east of Troy, N. Y., on the Poestenkill creek, about seven miles south-east of the Waterford nesting spot.—EDGAR BEDELL, *Waterford, N. Y.*

Hooded Warbler Near Elizabeth, N. J.—On June 19, 1921, the writer found a singing male Hooded Warbler (*Wilsonia mitrata*) in a patch of bushy and well watered woods among the hills of the Essex County Park Reservation, not far from Milburn, N. J., and well within a ten mile radius from Elizabeth. The bird was joined by a female, evidently its mate, and the concern evidenced by both birds as I searched about indicated that they were breeding in that vicinity, though in the time at my disposal I failed to locate the nest. This is my first summer or breeding season record of the Hooded Warbler in this section of New Jersey.—CHARLES A. URNER, *Elizabeth, N. J.*

A Deceived Yellow Warbler.—While W. F. Coultas, assistant in the Museum, State University of Iowa, and I were searching for Yellow Warblers' nests in which the birds had built a second bottom in order to cover an intruded Cowbird's egg, we found one that we saw plainly had two bottoms. On opening the lower part to get a sight of the covered egg, we discovered a small acorn, which the bird had evidently mistaken for a Cowbird's egg.—LEROY TITUS WEEKS, *Emmetsburg, Iowa.*

Piairie Warbler (Dendroica discolor) in January in South Carolina.—On January 9, 1922, I saw and thoroughly identified an adult male of this species within a few hundred yards of my house while it was searching for food in a thicket of lavender bushes. I fired at it with my auxiliary but am certain that I missed it, nor could I find it again after searching carefully all the surrounding country day after day for two weeks.

This is the first instance of my seeing this bird in the autumn (or winter) later than October 24.—ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

The Mockingbird at Prouts Neck, Maine.—On September 13, 1920, I saw a Mockingbird (*Mimus polyglottos polyglottos*), in the bushes near my cottage at Prouts Neck. Identification was certain, The bird had been seen for several days previously, but was at such a distance that there was some uncertainty as to the identity until the above date.—WM. PEARCE COUES, M.D., *Brookline, Mass.*

An Unusual Mockingbird Record.—During the first week in May 1921, a single Mockingbird lingered in Bushkill for at least one day and maybe longer. Its appearance was heralded by a period of full song from the shrubbery near the house about six thirty in the morning following which the bird was closely observed at intervals during the day. The unmistakable flash of white in the wings and tail against a background of hemlock covered mountains made a memorable picture of rather unusual composition.—EDWIN B. BARTRAM, *Bushkill, Pa.*

A Question Concerning the Distribution of the Long-billed Marsh Wren.—The ecological factors governing the distribution of the Long-billed Marsh Wren (*Telmatodytes palustris palustris*) are simpler than those for most birds. The bird breeds mainly, if not entirely, in cattail marshes, not only nesting, but obtaining all its food in such areas. It is also extremely local in distribution, being found only in certain cattail marshes, and entirely absent in others apparently equally well suited to it.

The cattail marshes are composed of two species of cattail, a broad leaved species (*Typha latifolia*) and a narrow-leaved (*Typha angustifolia*). The broad-leaved species occurs commonly in many places, but the narrow-leaved is more local. Many marshes are composed of the broad-leaved species alone, but I do not remember to have seen a marsh where the narrow-leaved species grows alone. It has been my experience that the Long-billed Marsh Wren is found only in these marshes containing the narrow-leaved cattail. I have noted this for a number of years on the Connecticut coast and have recently observed the same fact in western and central New York, finding the Marsh Wrens abundant in marshes at Syracuse where the narrow-leaved cattail was common, but absent in certain marshes of Cattaraugus County where only the broad-leaved cattail grew.

My observation of this association of plant and bird species may be merely coincidence. It would be interesting to hear from others who know not only the birds, but the two species of cattail. If there is a definite relationship between the distribution of *Typha angustifolia* and the Long-billed Marsh Wren, it may be because the narrow-leaved cattail makes a better nesting material, or perhaps because the wren's feet can more easily clasp the narrow leaves and more slender stems of this species.—ARETAS A. SAUNDERS, *Fairfield, Conn.*

Parkman's Wren near Chicago.—A pair of Wrens collected by Colin Sanborn at Beach, Illinois, April 24, 1921, were sent to Mr. Outram Bangs for identification and proved to be *Troglodytes aedon parkmani*. Another specimen (♂ 23749) was taken by the writer at Deerfield, Ill., May 15, 1921.

This western race seems to be gradually extending its range to the eastward but is a rare bird in Illinois.—HENRY K. COALE, *Highland Park, Ill.*

The Willow Thrush (Hylocichla fuscescens salicicola) on the Coast of South Carolina.—On October 7, 1921, I shot a female of the year of this western representation of Wilson's Thrush, and another young female at the same place, both of which had been feeding upon the berries of the viburnum.

I compared these birds with two specimens of *salicicola*, one from Washington, D. C., September 2, 1920,[1] and the other taken by Dr. Elliott Coues in Dakota and loaned to me by my friend Mr. J. H. Riley from the U. S. Nat. Museum collection, and they agreed perfectly with them.

The first record of the occurrence of this form in South Carolina was made by Mr. Leverett Mills Loomis from a specimen taken by him at Chester on October 5, 1888, and recorded in 'The Auk,' VI, 1889, 194. This record is cited by Mr. Ridgway in 'Birds of North and Middle America,' Part IV, 1907, 69, but is omitted in the A. O. U. 'Check-List' for 1910 and also in Dr. Chapman's 'Birds of Eastern N. A.,' 1912.

All species as well as subspecies of the genus *Hylocicla*, with the exception of the western forms of the Hermit Thrush, have been taken in and recorded from South Carolina, which is the only State from which all these forms have been recorded.—ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

Notes from Lawrence, Kans.—Thryomanes bewicki bewicki.—BEWICK'S WREN.—In the January issue of 1921 of the Auk Dr. C. E. Johnson of the University of Kansas reports the finding of a Bewick's Wren in the spring of 1920. My field notes show that a specimen was recorded in the spring of 1919, but too late to be listed in the Douthitt list of birds which was already partly off the press. The wren was observed in a patch of low shrubbery, largely buck-brush, at the edge of a thin

[1] Auk, XXXVIII, 1921, 463.

tract of timber northwest of the University but still in the city limits. I am familiar with this wren because of almost daily observations of it in another state in previous years. Its habits and calls are well known by me moreover the specimen permitted a long observation at close range so that all marks were easily and definitely identified.

Passerina ciris. PAINTED BUNTING.—In the spring of 1918 a pair of Painted Buntings appeared in Lawrence. They selected a nesting site in a Mahonia bush which grew at the side of a fire-place chimney. The location was in a thickly settled residence district on Louisiana street. They hatched out a brood of four and all observations show that the young passed safely through the time of hatching and departure from the neighborhood. The next year (1920) a pair again appeared in the same locality. They remained thereabout throughout the season and evidently had a nest nearby, but it was never located. They were not reported the following season.

Zenaidura macroura carolinensis. MOURNING DOVE.—In June of 1921, we discovered a Dove's nest built upon a Robin's nest of that season. The nest was located in an old decayed apple tree. The few twigs that had been carried in served as a resting place for one Robin's egg, already pipped, as well as for the two Dove's eggs. Just before the hatching of the Dove brood the Robin egg disappeared.—BESSIE D. REED, *Lawrence, Kas.*

Notes on the Birds of the Beaver River Valley in Saskatchewan.—The following notes, I believe, are of some value as extending the known distribution of a few birds, none of which are uncommon or difficult to find in the region named. The first three in my list have not, so far as I know, been mentioned in any published list of Saskatchewan birds.

Piranga ludoviciana. WESTERN TANAGER.—Common at Big River. I have also seen it at Lac la Ronge, where, however, I found it difficult to approach, though very alluring because of its frequently heard song.

Wilsonia canadensis. CANADA WARBLER.—Occasionally seen at Big River. It was common at Green Lake, in August, 1919.

Nannus hiemalis. WINTER WREN. Abundant in the spruce bogs about Big River.

The following have been reported from other parts of Saskatchewan.

Ardea herodias. GREAT BLUE HERON.—Not seen in 1919; but frequently in 1920, and in widely separated parts of the region, from Ladder Lake (near Big River), the Crooked River, the mouth of the Dore River, to the north end of Peter Pond Lake (Buffalo Lake), where it was shot by an Indian, who showed it to me with the comment that he had never seen its like before. He laughed scornfully at the thought of eating it—for it was disappointingly unappetizing in its gauntness.

Lagopus lagopus. WILLOW PTARMIGAN.—Four specimens, shot in their winter plumage (in late December) were sent to me in the winter

of 1920–21, from Green Lake, Sask. I call the attention of ptarmigan specialists to the fact that all four had the *shafts of the primaries black*. I have seen no other Sasketchewan ptarmigans.

Archilochus colubris. RUBY-THROATED HUMMING-BIRD.—Occasionally seen in July along the Beaver River, as far north as Ile a la Crosse. The Hudson's Bay Company Agent at Lac la Ronge tells me that it occasionally visits his flower-garden in summer; but I did not see it there myself.

Dendroica palmarum. PALM WARBLER.—A dried specimen has been sent to me from Green Lake, Sask. (The covering letter says, "a very pretty little bird.")—JOHN SMITH DEXTER, *Saskatoon, Sask.*

Bird Changes Caused by the Winter of 1917–1918.—The bleak winter of 1917–1918, which broke most records for cold or long winters, made some remarkable changes in bird-life here, many of which yet remain. The Mockingbird, the Carolina and Bewick's Wrens seem to have suffered most, and did not become normal in numbers until the winter of 1919–1920. The Golden crowned Kinglet, once very plentiful in winter, was very scarce until the spring migration of 1921, since which time they have been almost normal in numbers. The Tree Sparrow, so far as I know, was never reported from here until that winter and even old bird students had never seen one. A few wintered here in 1917–1918, several the next winter, even more in 1919–1920, and they were positively abundant in 1920–1921. So far I have not seen them this winter, 1921–1922, but the weather has been very mild, up until Christmas. Another interesting thing about this bird is the way it has prolonged its stay in the spring. In 1918 it left Feb. 12; in 1919, Feb. 18; in 1920, Mar. 12; and in 1921, Mar. 6. Mr. A. F. Ganier of Nashville, Tennessee, reports that the Tree Sparrow has had much the same history in middle Tennessee as it has had here since the record-breaking winter. The Towhee, once quite plentiful in winter, has just now regained its former abundance. Just how permanent these changes are or how general in extent they are, it will take a long time to tell, but I should like to hear from many sections of the country on this subject.—GORDON WILSON, *State Normal School, Bowling Green, Kentucky.*

Arkansas Kingbird and Egrets in Connecticut.—On the afternoon of November 4, 1921, while crossing a section of pasture land in east Meriden I noticed two birds flying to a large tree about fifty yards distant. They alighted a few feet apart, almost facing me, and I trained my eight power glasses on the smaller and unfamiliar bird,—for the other was a Robin.

At first glance it reminded me of the Crested Flycatcher; for the belly and lower breast were of a clear yellow, but above this a light ash shading to an almost white throat. The uncrested head was also of a much lighter shade than *Myiarchus crinitus*, and although no crown patch was visible there was a darker section from the lores to the auriculars.

Feeling certain that this bird was not an unusually late *M. crinitus* (my latest record being September 16) I began circling the tree to obtain a clear view of the lower back and tail then hidden by the branch, but unfortunately before I had taken a half dozen steps both birds took fright and vanished in the distance.

Although the observation was short, and the white web of outer tail feathers was not visible I feel convinced that this bird was the Arkansas Kingbird (*Tyrannus verticalis*), for it was not the well known Crested Flycatcher of our Connecticut woods and orchards.

While the "wanderlust" of the American Egret has enabled northern bird students to report small groups of *Casmerodius egretta* during the past summer I might add that at sundown on September 4, 1921, I saw a white fleet of twenty of this species and with them two Great Blue Herons flying westward at Saybrook Point, Connecticut.—Lester W. Smith, *Meriden, Conn.*

Notes on Early Summer Birds of the Virginia Coast.—The following notes were made during a visit to Wallop's, Cobb's, Pig and Bone Islands, Virginia, from June 28 to July 2, 1921, in company with C. K. Roland. Apart from the observations on the breeding birds, the results of the trip seemed to me of unusual interest, due to the abundance of many species of shore-birds and water-fowl which we had no idea of meeting in this vicinity at this particular time of the year.

One is naturally led to speculate on the reasons for the presence of many of these birds so far south at so early (?) or late (?) a date. A search of the available migration records for the states to the north seem to shed no light on the subject and we are still at sea as to whether: (1) the present year has been an unusual one for the earliness or lateness of migrants; or, (2) the islands in question, because of their isolation, form a haven of refuge for many barren, crippled, or non-breeding birds or (3) many individuals of the species in question pass directly over a large portion of our Atlantic seaboard on the southward flight and may appear here long before they are to be expected in more northern latitudes.

June 27 to 29 inclusive, were spent on Wallop's Island, Accomac County, where, under the protection of the Wallop's Island Association, the owners, a couple of colonies of possibly 40 pairs of Least Terns, and a somewhat smaller number of Common Terns were nesting. Piping Plovers were also rather plentiful, and we saw several of their half-grown young along the deep wind-swept beaches at either end of the island. Among the other breeding species of note we might mention the Boat-tailed Grackles, which were quite common, although this is about the northern limit of their breeding range.

On June 27 we saw three female or immature Red-breasted Mergansers, and the following morning came upon one resting on the beach along one of the inlets. On June 29 a flock of ten Double-crested Cormorants flew over, heading north, and Black Terns were noted on both the 29th and 30th.

On the evening of June 30, upon our arrival at Cobb's, we found possibly twenty Black-bellied Plovers, all in the winter plumage, four Turnstones, and a male American Scoter, within a few hundred yards of our landing place.

On the following day we made a trip to the northern end of the island, and a brief visit to Pig Island, which is accessible by wading for a couple of hours during low tide. Here we found an immense colony of Skimmers in possession of the island, which is probably no more than three feet above ordinary high-tide at its highest point. Their nests were so close that we had difficulty in picking our way among them, and during our visit the air was filled with their graceful, if somewhat grotesque forms. They were easily the most abundant birds on the island, although our stay was too short to attempt any estimate of their numbers. We were told that a recent visitor to this particular island had tarried too long and had only been saved from spending the night on the island by the timely assistance of a passing fisherman.

On the adjoining beach of Cobb's we spent a very interesting half-hour with a young Oystercatcher which was just in that awkward stage between the downy and juvenal plumage, although it was fully as large as an adult Upland Plover. Its sprinting ability would have done credit to a young ostrich had it chosen a straightaway course, but the plaintive peeping of its parents in our rear caused it to double back, and a well-placed hat impeded its progress until we gathered it up and placed it in an improvised pen in the hatchway of a nearby piece of wreckage.

After trying vainly to find an exit it soon became quiet and allowed us to handle it quite freely, lying flat on the sand much of the time, while we examined, sketched and photographed it. A few minutes later we gave it its liberty and when last seen it was racing pell-mell down the beach toward its parents. As nearly as I could judge there were probably half a dozen pairs of these striking birds on the island at the time, doubtless all breeding.

Laughing Gulls, Gull-billed, Common and Forster's Terns, Clapper Rails, one or two pairs of Willets, and possibly the same number of Wilson's Plovers were also seen on the island during the course of the day. The Least Terns have never returned since the days of their millinery popularity, and, we were also told by Captain Isdell, the genial and interesting proprietor of the hotel, that the Laughing Gulls had entirely forsaken a portion of marsh near the hotel after being scared off several years ago by a flash-light.

The migrant birds were particularly interesting, too: Black-bellied Plovers, a large flock of Knots, several in the spring plumage, and one Semipalmated Plover being seen along the beach.

It was on July 2, however, while on a visit to Bone Island, at low tide, that we saw the unusual spectacle, for this season, of myriads of Knots, Dowitchers, Sanderlings, Least and Semipalmated Sandpipers, with a

few Pectoral, White-rumped, and Red-backed Sandpipers, Black-bellied and Semipalmated Plovers, a Wilson's Snipe and a Turnstone, scattered over the broad mud-flats toward the landward side of the island. Toward the seaward side, which is scarcely higher than Pig Island, were hundreds of Skimmers, Terns, Gulls, and a scattering of Oystercatchers, circling about, or perched in "rafts" along the low flat bars exposed by the tide and in the bay a solitary Horned Grebe and a Red-breasted Merganser were riding the swells. The whole scene formed a very fitting climax to one of the most enjoyable and profitable ornithological pilgrimages in which it has my good fortune to participate.—E. L. POOLE, *Reading, Pa.*

Some Records from the Madison, Wisconsin, Region for the Spring of 1921.—

1. **Chaulelasmus streperus.** GADWALL.—Four individuals observed on May 6.

2. **Bartramia longicauda.** UPLAND PLOVER.—One specimen on fence-post. Allowed two observers, on foot, to approach within fifty feet.

3. **Buteo borealis krideri.** KRIDER'S HAWK.—One individual, in flight, studied at close range, directly over-head. It was engaged by several crows, and remained under perfect observing conditions for a considerable period.

4. **Falco peregrinus anatum.** DUCK HAWK.—Mr. Herbert Stoddard of Milwaukee introduced me to two nesting sites of the falcon, both about twenty-five miles northwest of Madison, and both on lofty and relatively inaccessible rock ledges. Each contained young birds. Mr. Stoddard, in the initial article of this 'Wilson Bulletin' of December last, has written the record of his connection with both nests.

5. **Phloeotomus pileatus abieticola.** NORTHERN PILEATED WOODPECKER.—Several birds heard or observed in this extreme northwestern part of Dane County along the Wisconsin River and in Sank County through which this Baraboo Range of sharp and rugged hills extends. The forbidding nature of the region renders it safe from easy pedestrianism and constitutes it one of the last stands in southern Wisconsin for these epic woodpeckers.

6. **Empidonax virescens.** ACADIAN FLYCATCHER.—One singing male collected on May 25.

7. **Sturnella neglecta.** WESTERN MEADOWLARK.—This bird seems to be growing more common with us. During the spring of 1921, I heard six or seven singing, and doubtless nesting, birds. The types of country selected by *neglecta* was identical with that chosen by *magna*.

8. **Chondestes grammacus grammacus.** LARK SPARROW.—One singing male collected from a small nesting colony twenty-five miles to the north-west of Madison on April 30. The colony has been established on its restricted sandy flats for a number of years.

9. **Zonotrichia querula.** HARRIS'S SPARROW—One male bird observed near Madison on May 21.

10. **Spizella pallida.** CLAY-COLORED SPARROW.—One or two pairs of Clay-colored Sparrows, the remnant of a very small colony from which the writer took a set of eggs three years ago, nested in the Lake Forest district in the environs of Madison in the spring of 1921. It may be of interest to record the following fact: if one were to describe an arc with a diameter of about a third of a mile, at one foot, in a marsh meadow, he would find a small colony of nesting Henslow's Sparows at the other foot, in a dry, rolling, bush-studded field, the Clay-colored Sparrows; and in the upland meadow adjacent to the latter, a thriving colony of Grasshopper Sparrows.

11. **Spiza americana.** DICKCISSEL.—Last year was decidedly a Dickcissel year in the Dane County region. The birds were abundant. I have heard as many as a hundred singing during the course of a long day's trip through favored districts.

12. **Protonotaria citrea.** PROTHONOTARY WARBLER.—These warblers are rated as common in the north-western part of Dane County along the river-bottoms of the Wisconsin. The bird life in these heavily timbered flats was often representative of the upper-austal zone rather than the transition. There were numerous Red-bellied Woodpeckers; fairly numerous Cardinals, Blue-grey Gnatcatchers, Louisiana Water Thrushes, and Red-shouldered Hawks; a Yellow-breasted Chat; and in the vicinity, nesting Cerulean Warblers, and at least two Bewick's Wrens.

13. **Vermivora celata celata.** ORANGE-CROWNED WARBLER.—One specimen observed on May 17.

14. **Dendroica cerulea.** CERULEAN WARBLER.—Birds observed in Baxter Hollow, Sank County, on June 12.

15. **Seiurus noveboracensis notabilis.** GRINNELL'S WATER-THRUSH. —Two specimens collected near Madison.

16. **Seiurus motacilla.** LOUISIANA WATER-THRUSH. — Two specimens collected along the Wisconsin River bottom lands in Dane County.

17. **Icteria virens virens.** YELLOW-BRESTED CHAT.—One bird heard singing in a clearing in the Wisconsin River bottom lands. One pair, probably nesting birds, seen in mid-June in the Winga Lake region on the outskirts of Madison.

18. **Thryomanes bewicki bewicki.** BEWICK'S WREN.—I studied one of a reported nesting pair closely. (Mr. S. Paul Jones later verified my identification.) Mr. Herbert L. Stodderd a week or so before had wounded and failed to secure anther specimen in a distinct half a mile away. These wrens were in the vicinity of Sauk City. On April 15, 1916, I identified another Bewick's near Madison. The species should be removed from the hypothetical list of Wisconsin birds.

19. **Baeolophus bicolor.** TUFTED TITMOUSE.—On February 1, I collected a specimen near Madison, the second or third collected specimen on record for the state, so far as I know.—WARNER TAYLOR, *219 Clifford Court, Madison Wisconsin.*

Notes on Connecticut Birds.—On April 24, 1921, I saw a Turkey Vulture (*Cathartes aura septentrionalis*) soaring over the Woodway golf course. The place where the bird was seen was about five miles north of Long Island Sound. There was a stiff west wind blowing, following a strong east wind and rain the day before. The day was warm, in the early spring. The bird was soaring in a characteristic manner and drifting eastward. The bird was some distance away, but I observed it for some time, and its size and general contour and method of flying were identical with what I had often observed of the Turkey Vulture in the southern states, and I think there can be no doubt of the identification.

This is the first one of these birds that I have ever seen in Connecticut, and the number reported for Connecticut is so few that it seems worth while to add this to the list.

On October 15, 1921, I collected a female Scarlet Tanager (*Piranga erythromelas*). It was feeding in a flock of Field Sparrows and Chippies. The latest previous record that I find is recorded in 'The Birds of Connecticut' under October 10, and it seems perhaps worth while to add this record as the latest occurrence of the bird.—Louis H. Porter, *Stamford, Conn.*

Spring 1917 Migration of Shore Birds at Branchport, N. Y.—The spring of 1917, was rather dry and the water in the lake was low leaving exposed some of the muddy shore at the edge of the marsh and the long sandbar was completely above the water.

Probably due to this fact an unusual number of shore birds stopped here the latter part of May.

The Red-backed Sandpiper (*Pelidna alpina sakhalina*) is a regular fall migrant here but is rarely seen in spring. May 20 twelve Red-backs stopped here with a large flock of Leasts, and Semipalmated, six Greater Yellowlegs, two Lesser Yellowlegs and ten Semipalmated Plover. Two Red-backs were seen May 31.

May 27 was a dull day with occasional light showers and a great bunch of shore birds came in. There were several hundred Least and Semipalmated Sandpipers and Semipalmated Plover on the mud at the mouth of the inlet. They were noisy and active, chasing each other and chattering, the Plover making little squeaks and grunts. On the gravely bar were as many more Least and Semipalmated Sandpipers and Semipalmated Plover and at least fifty Red-backed Sandpipers and nine Turnstones. In the afternoon seventeen Knots joined the great whistling, chattering bunch. This is my first record of Turnstones and Knots.

Other birds on the lake at this time were, large flocks of Ring-billed and Bonaparte's Gulls, about forty Common Terns, eight Black Terns, one American Merganser, female, several small flocks of Lesser Scaup Ducks, six White-winged Scoters and two Loons.

Another flock of about fifteen Knots stopped on the bar about an hour on May 29.—Verdi Burtch, *Branchport, N. Y.*

Rare and Uncommon Birds at Branchport, N. Y.—Hesperiphona v. vespertina. EVENING GROSBEAK.—Eight Evening Grosbeaks were in a locust tree feeding on the seeds, in front of my house, the morning of March 16, 1920, and were seen again farther down the street the same day. Ten Evening Grosbeaks were seen two miles north of Branchport March 17, and four more April 16. On November 17, 1921, after a rainy night, thermometer 46° F, four Evening Grosbeaks were feeding on the seeds of some maples in the street. There were three males and one female and they were feeding quietly for about one-half hour then, with a sudden impulse all flew off southwest.

Sterna caspia. CASPIAN TERN.—There is a long narrow sand bar in lake Keuka that extends nearly across the harbor at Branchport. In the spring when the water is high it is broken into several long narrow islands with very shallow water between them. And here the Caspian and Common Terns and Bonaparte's, Herring and Ring-billed Gulls congregate to rest and sleep. My records for Caspian Terns not before reported are: April 23, 1920, five seen; April 28, one seen; May 1, four seen; May 3, one seen; May 9 one seen, the last for 1920. April 23 1921, was cloudy in the morning, thermometer 56° F., one Caspian Tern was seen, April 25 there were fourteen Caspians, the largest number that I ever saw together. May 14 at 7 P. M. I heard the peculiar rasping cry of a Caspian Tern and saw it circling around over the village. It seemed to be excited and flew round and round several times then started off northwestward, then I saw four more much higher up and going in the same direction and the first one joined them as they passed on. The Caspian Tern has been a regular spring visitant at Branchport since 1917.

Sterna hirundo COMMON TERN.—The Common Tern has appeared at Branchport regularly every spring since 1917. The records not before reported are, three seen May 10 and three seen May 20 1920. In 1921, a flock of twenty Common Terns came on the lake May 15, there were six or eight May 19, four May 22 and last, a single one was seen May 27.

Marila collaris. RING-NECKED DUCK.—May 3, 1900, a flock of Ring-necked Ducks were on the lake at Branchport for several hours and Nov. 11 1921, I saw a single Ring-necked Duck in the harbor.

Micropalama himantopus. STILT SANDPIPER.—Sept. 10, 1902, I noted a Stilt Sandpiper feeding with two Yellowlegs on the muddy shore. It stayed on all day and all day the 11th.

Passerherbulus nelsoni nelsoni. NELSON'S SPARROW.—Sept. 15, 1921, I flushed a small sparrow from the thick marsh grass and it lit in the cat-tails about two rods ahead. I had a good look at it with eight power binoculars and did not hesitate to name it a Nelson's Sparrow. I had gone on but a short distance when a second one flew up from the grass and lit in the cat-tails giving me a good chance to study it. Oct. 7 and again the 8th I saw a Nelson's Sparrow in this same place. These are my only records of Nelson's Sparrow for Branchport, though I have one spring

and two fall records of the Acadian Sparrow. (The Auk, Vol. XXXVII, p. 307.)

Phalaropus fulicarius. Red Phalarope.—Oct. 12, 1921, 9.30 A. M. I saw a Red Phalarope with a flock of Pectoral Sandpipers. It was energetic and quick in its movements and soon left the Pectorals behind, taking short runs, wading out in the shallow water and swimming the muskrat runways all the time picking up food. Three hours later it was gone and I did not see it again.

Xema sabini. Sabine's Gull.—A Sabine's Gull shot on lake Keuka at Branchport, Oct. 29 1921. It was an immature bird and the only one seen. There seems to be only one other record of Sabine's Gull in western New York, that of Dr. E. H. Eaton's specimen which was taken on the Montezuma Marshes about the year 1887 (Birds of New York, Eaton, Vol. 1 p. 137).—Verdi Burtch, *Branchport, N. Y.*

A Strange Migration.—This locality is in eastern Iowa and about 65 miles north of the Missouri line. The weather during the early part of January 1922, had been what one might call "fine winter weather." The temperature had been oscillating between zero and 32° above F. From January 12 to 18 there had been no snow at all and the ground was bare. On the 18th at 3:00 P. M. a very fine snow began to fall. By 9:00 P. M. the ground was covered with about two inches. There was not a breath of air moving. The night was perfectly still, the temperature was 18° F. above and the fine snow flakes continued to descend lazily to the earth.

At 9:00 P. M. small voices began to be heard in the distance towards the northwest. Presently they were overhead and in every direction. Judging by the volume and quality of the sound, the travelers must have been a large concourse of small birds. They were moving in a southeasterly direction. For one and one-half hours I heard their voices, many of them. I could hear them as they were approaching, could hear them overhead and for a considerable distance after they were past. The flight of birds was continuous though many more could be heard at some times than at others. Several thousand birds, at least, must have passed this locality during that time. All these birds seemed to belong to one species. Their note is somewhat like that of the Bluebird but higher in pitch and varied occasionally by a little short trill. I have heard these same voices before in this locality but always in the air, at night, and during migration time in spring or fall but never before, in the middle of winter!

At 10:30 the wind began to moan and sigh in the tree tops and the flight of the birds ceased. Gradually the northwest wind became more boisterous and the temperature fell to 5° F. below zero during the night. Next day was fair and cold.

This peculiar and interesting phenomenon at once raises several important questions. What species of birds were these? Where did they

come from? Did they intuitively know or feel the approach of the cold wave or did the storm stir them up and did they gain an hour and a half on the wind by their more rapid flight? If, as would seem, these are migratory birds, how can we account for the fact that they did not move south in December when the temperature went down to 7° F. below zero and the ground was also covered with snow?

These all appear to me to be matters of considerable scientific interest. —E. D. NAUMAN, *Sigourney, Iowa.*

Bird Banding as an Opportunity to Study Character and Disposition.—Birds and animals have as much character and disposition as people, and bird banding offers an excellent chance to study individuality in birds when they are actually in your hands, where you may make a close up examination and note their actions.

At the Waukegan, Ill., Bird Banding Station I have studied the action of the birds handled for the last five years and have noted some very interesting characters in the different birds handled.

The White-throated Sparrows arrived at our station about October 4, and kept coming until October 25, when the last new bird was banded, and from them on only a few repeating birds trapped. These seemed to like our restaurant and became regular boarders. Early in November we noticed that a certain five were always together in some of the traps at night. We handled them so often that it was noticeable that each had a different disposition. There was the 'Fighter,' the 'Squealer,' the 'Quiet One,' the 'Kicker,' and one just ordinary bird, which tried a little of all of the actions of the other four.

A Golden-crowned Kinglet was trapped and seemed so surprised that it laid perfectly quiet while I put the band on its leg and when released it just stood up, straightened out its feathers and then calmly looked me over for a full minute before flying to the nearest limb.

A female Downy Woodpecker trapped last year squealed all the time it was held and when trapped again this year it squealed louder and longer than before; other Downies would fight but were quiet.—WM. I. LYON, *Waukegan, Ill.*

A Correction for Lake County, Minnesota, Birds.—In my 'Additions to the Birds of Lake County, Minnesota' (General Notes, Vol. XXXVIII, 1921, of The Auk), *Pelidna alpina sakhalina*, the Red-backed Sandpiper, is erroneously listed; this should have been, instead, *Micropalama himantopus*, the Stilt Sandpiper.—CHARLES E. JOHNSON, *University of Kansas, Lawrence, Kas.*

RECENT LITERATURE.

Chubb's 'Birds of British Guiana.'[1]—The second and concluding volume of this notable work has at last appeared, having been long delayed by war conditions. In our notice of Volume I we commented on the invaluable work of the late Frederick Vavasour McConnell, upon whose collection the report is primarily based, and on the generosity of Mrs. McConnell who has provided for the publication of the volumes.

With regard to the present volume we can say that it is fully up to the high standard of its predecessor as regards the work both of the author and publisher. The introduction contains an itinerary of the second journey to Mt. Roraima in August 1898, covering some seventy pages, by Mr. John J. Quelch who accompanied Mr. McConnell; a most interesting and thrilling account of the experiences of the party, with comments on both the fauna and flora of the regions traversed. Half-tone views of the summit of the mountain and portraits of natives serve as illustrations.

The main text covers the passeriform birds, 367 in number with ten colored plates and 204 useful text figures, of heads, bills, tails, and wings, all of which are drawn by Grönvold.

We find only three new forms described in this volume— *Grallaria regulus roraimae* (p. 80); *Vireo roraimae* (p. 393) and *Pachysylvia thoracicus abariensis* (p. 395), but no less than twelve genera and forty-two new species and subspecies have been published elsewhere as the work progressed, all based upon a study of the McConnell collection. The genus *Vavasouria* named in his honor is proposed for the remarkable white Bell-bird formerly known as *Casmorhynchus*.

Mr. Chubb's treatment is very satisfactory, the descriptions are full, the synonymy admirable and the accounts of habits selected from the writings of the best authorities on the ornithology of British Guiana—Quelch, Brown (Canoe and Camp Life), Schomburgk, Beebe, etc. The work is likely to remain the authoritative one on the birds of British Guiana for some time to come and will be an important aid to the many ornithologists whose attention is now being directed to the neotropical avifauna.—W. S.

Bannerman on the Canary Islands.[2] This interesting book is the out-

[1] The Birds of British Guiana, based on the collection of Frederick Vavasour McConnell, Camfield Place, Hatfield, Herts. By Charles Chubb, F. Z. S., M. B. O. U., Zoological Department, British Museum. Vol. II. London: Bernard Quaritch, II Grafton Street, W. 1921, pp. i–xcvi+1–615 royal 8vo. 8 half-tone plates, ten colored plates and 214 text figures.

[2] The Canary Islands Their History, Natural History, and Scenery. An account of an Ornithologist's Camping Trips in the Archipelago. By David A. Bannerman, M. B. E., B. A. (Cantab.), M. B. O. U., F. R. G. S., Etc. With Illustrations and Maps. Gurney and Jackson. London: 33 Paternoster Row. Edinburgh: Tweedale Court. 1922, 8vo. pp. i–xv + 1–365, 84 illustrations and maps. Price 30 shillings net.

come of ten trips to the Canaries to investigate the avifauna of this famous island group on behalf of the Bird Department of the British Museum. The ornithological report comprises Parts II and III, which treat in detail the author's several expeditions, while Appendix "B" gives a systematic list of the species of birds known from the islands, and 25 others of doubtful occurrence. The ornithological report has already been published in 'The Ibis' and has been reviewed in these columns.

Incidentally the author explains that the investigation of the bird life required the acquisition of some knowledge of the geology and plants of the islands and thus material was secured for Chapters II–VI, which cover these subjects and the more general problem of the distribution and origin of life on the islands.

An introductory chapter treats of the discovery, conquest and early history of the Canaries which will prove of much interest to anyone studying the natural history of the group.

The volume is fully illustrated with views of the country, maps, and several excellent colored plates of birds. All in all Mr. Bannerman has produced a volume which cannot but please the general reader who is interested in travel and exploration, while it demonstrates clearly the methods of intelligent present day research. Collecting and listing the birds of a region by no means solve the problem. One must also study at least the major features of the plant life and the general environment, and ascertain what factors have been active in developing the fauna of today and in bringing about its present distribution.

To the student of zoogeography the book will be an important work of reference and should be in all scientific and general libraries. For detailed comment on the ornithology we must refer to our previous review in 'The Auk' 1920, p. 688.—W. S.

Abel Chapman's 'Savage Sudan.'[1]—In this attractive volume the well known hunter-naturalist Abel Chapman has presented the results of his many expeditions into this fascinating section of Africa which, it will no doubt surprise many to know, comprises one fifth of the entire African continent. While in South Africa the exploits of the early hunters of big game can never now be repeated, and while East Africa is being opened up to white settlers, Mr. Chapman tells us that in the Sudan primaeval condition remain absolutely unchanged, and he prophecies that while capable of development it will never become a "white-man's land."

His ambition in preparing the present volume is "that ere the reader has completed his perusal, he will feel satisfied that he has been 'personally

[1] Savage Sudan. Its Wild Tribes, Big-Game and Bird-Life. By Abel Chapman., author of 'On Safari in British East Africa,' 'Wild Spain,' 'Wild Norway,' etc. With 248 illustrations, chiefly from Rough Sketches by the Author. Gurney and Jackson, London: 33 Paternoster Row. Edinburgh: Tweeddale Court. 1921. 8vo. pp. i–ix+1–452. Price 32 shillings net.

conducted' throughout savage Sudan and afforded an insight into both the physical features and the wild fauna of the country," and we think that his ambition has been realized.

While his descriptions, comments and anecdotes are sometimes thrown together in a somewhat irregular manner the vividness of all is so striking that the reader often feels as if he were an eye witness to the incidents and he is carried along from one stage of the journey to the next, into the heart of the country and out again, with always some new experience before him.

Naturally the author pays his greatest attention to the big game, but there are admirable descriptions of the deserts, rivers and forest country and constantly recurring observations on the birds, with good field sketches by the author, showing characteristic poses and actions. There are also frequent philosophic comments upon problems that present themselves in connection with the various animals and birds that are being discussed. Of these the author evidently feels most strongly on the subject of the extreme claims of what he terms the "color protectionists," and he scores them without mercy. Speaking of Thayer's 'Concealing Coloration in the Animal Kingdom' he says: "In America we know, they don't do things by halves. This book, however seemed to me to top the summit. I gently laid it aside—asphyxiated by the magnificient audacity of its assumptions. Subsequently, however, relief came when I read in another and authoritative American publication (The Auk) a review of Thayer's work that runs as follows: "By skilfull jugglings we are shown how anything and everything may be rendered inconspicuous etc." He presents an interesting array of facts drawn from his personal observations on the protective and non-protective character of animal coloration in different species and emphasizes the important part that sunlight plays in making an animal appear light or dark. "The Zebra" he goes on to say "was probably the worst prototype of their propaganda that the color protectionists could have selected." They are, he says, conspicuous and perfectly distinguishable from other animals at long distances.

"No distance lends enchantment to *my* view,
Nor paints *my* distant Zebra blue."

The ornithologist as well as the general zoologist will find a wealth of varied information in Chapman's book and all who enjoy accounts of travel will find it delightful reading.

We notice one description of a new species buried in the text at p. 110 which has apparently not been published elsewhere, at least there is no indication of the fact. This is *Aquila albipes* the White-footed Forest Eagle, which, contrary to the views of the authorities at the British Museum, the author regards as distinct from *A. rapax* of which they regard it as a dark phase. The type is preserved in the British Museum.— W. S.

McAtee's Spring Bird Lists.[1] Everyone in these days makes bird lists and the spirit of competition and the resulting desire to record the largest number of species are only human even though they are, as our author well says, "not for the best interests of ornithology."

Those who would counteract the tendency to inaccuracy, inevitably and unconsciously developed by competition, would do well to follow Mr. McAtee's admirable suggestions. He has insisted that the several persons making up the party on his "record walks" should *all* satisfactorily *see* each species before it is accepted for entry on the list, while species difficult to identify have been collected. Subspecies he wisely ignores as they are "scarcely a subject for field observation." This we consider an excellent practise for the observer who claims to be able to distinguish in the field, by sight alone, such races as the Northern and Southern Parula Warblers, the Northern and Southern Robin or the Northern and Southern Maryland Yellow-throat thereby places his entire list under suspicion.

Mr. McAtee's trip each year has been a continuous walk not a skipping from one point to another by rapid transit, and by selecting a definite route to be followed year after year the comparison of lists becomes more interesting than a comparison with lists made by others in a different section.

The actual number of species observed on these ten May walks varied from year to year from 73 to 101, while the largest lists were on May 11 and May 13, showing, as we should expect, that the height of migration of Warblers, etc., was reached abou tthe middle of the month. The total number of species for the ten walks seems to be 146.

In commenting on the peak of the migration mention is made of the Connecticut Warbler, a species not found in any of the lists and excessively rare east of the Alleghanies in spring. We wonder if its mention was not a slip of the pen.—W. S.

Kopman, on the Wild Life Resources of Louisiana.[2]—This important contribution to the mammalogy and ornithology of Louisiana published as Bulletin 10 of the Department of Conservation is apparently the work of Mr. H. H. Kopman, although his name does not appear on either title page or cover. After preliminary remarks on the economic value of wild life there is a discussion of the natural divisions of the state and a map illustrating the extent of the marshes, prairies, and several wooded districts into which it is divided. Then follow detailed accounts of the habits, distribution, etc., of the more important mammals and game birds with nominal mention of probably all of the birds known to occur in the state.

[1] Ten Spring Bird Lists made near Washington, D. C. By W. L. McAtee. The Wilson Bulletin, December, 1921, pp. 183–192.

[2] State of Louisiana. Department of Conservation. M. L. Alexander, Commissioner. Bulletin No. 10. Wild Life Resources of Louisiana, Their Nature, Value, and Protection. Published by the Department of Conservatien, New Orleans Court Building, December, 1921. 8vo. pp. 1–164.

The arrangement of the ornithological matter is not very satisfactory for one seeking data upon any given species, especially in the absence of an index, as can be judged from the character and sequence of the headings, i. e. Ducks and Geese, Coot, Rails and Gallinules, Snipe, Plovers and other shore birds, Wild Turkey, Quail, Prairie Chicken, Doves, Raptores, Smaller Land Birds, Non-Game Water Birds, and as an appendix, Birds of Accidental Occurrence.

The same prominence could, we think, have easily been given the game birds, in a more systematic and better balanced grouping. However, the report places a vast deal of information at the disposal of the general reader and will do much good in the campaign for conservation, while the map and accompanying discussion will be most welcome to the student of zoogeography. A large number of half-tones illustrate the report but as a rule they do not show to advantage, probably owing to the texture of the paper. Mr. Kopman is to be congratulated upon a valuable contribution to the literature of the conservation of wild life.—W. S.

Todd on the Genus Pipromorpha.[1] Mr. Todd's revision of this genus of flycatchers is the first of a proposed series of 'Studies in the Tyrannidae.' After an examination of 460 specimens including the series from most of the larger museums of America, Mr. Todd is able to recognize four species, *rufiventris; macconnelli* (three subspecies); *oleaginea* (five subspecies) and *assimilis* (two subspecies).

P. macconnelli amazona (p. 179) Buena Vista, Bolivia; and *P. oleaginea pacifica* (p. 187) Bucay, Ecuador, are described as new, while four of Mr. Chubb's recently described races of *P. oleaginea* fall into synonymy in Mr. Todd's opinion. The genus *Pipromorpha* he finds is very close to *Mionectes* from which Ridgway separated it in 1907, in fact there is but one character—the shape of the ninth primary which serves to separate it! The work seems to be very carefully done and the descriptions, synonymy and lists of specimens are full and in every way satisfactory.—W. S.

Recent Papers by Chrostowski. Several papers on neotropical birds have appeared during 1921, by the Polish ornithologist T. Chrostowski. In one of these [2] seven rare or little known Brazilian birds are discussed, one of which *Nonnula hellmayri* (p. 39) from Parana is described as new. Another paper[3] deals with the types of neotropical birds in the Museum of the Academy of Sciences of Petrograd, the collections of F. H. von Kittlitz and Emele Menetrice being considered. Incidentally, *Planesticus bianchii* (p. 28) from "Brazil" is described, as new. In connection with

[1] Studies in the Tyrannidae. I. A Revision of the Genus Pipromorpha. By W. E. Clyde Todd. Proc. Biol. Soc., Wash., 34 pp. 173–192. Dec. 21, 1921.

[2] Ann. Zool. Mus. Polonici Hist. Nat. 1, Fasc. 1. September 30, 1921. pp 31–40. [In English and French.]

[3] Ibid. Sept. 30, 1921. pp. 9–30. [In French.]

these papers attention might be called to the author's report[1] on a collection made at Parana in 1910 and 1911 which apparently appeared in 1912.—W. S.

Oberholser on Bird Life in the Great Basin.[2]—One naturally associates Dr. Oberholser's name with the most technical treatises dealing with nomenclature and taxonomy, and the present paper will doubtless come as a pleasant surprise to many who are unacquainted with his versatility. He has here presented us with an admirable popular sketch of the physical characteristics and bird life of one of the most interesting of the desert areas of the west—the Great Basin.

The habits and appearance of many of the water and shore-birds of Tule and Pyramid Lakes are described in some detail as well as of a number of the more truly desert birds which are not dependent upon the presence of bodies of water. The student of the life history and behavior of our native birds will find Dr. Oberholser's paper one well worth consulting. While no scientific names appear, one cannot but notice some of the peculiarities of the English names, for which the author is probably not responsible. Instead of following the standard forms established by the American Ornithologists' Union and in very general use, we find the editor of the Smithsonian Report, insisting that "humming bird" and "mocking bird" consist of two words with not even a hyphen, though "meadowlark" and "nighthawk" pass as single words. In another report from the same institution however, we find "humming-bird" hyphenated!—W. S.

McAtee's Community Bird Refuges.[3] In this attractively gotten up pamphlet the author calls attention briefly and concisely to the advantages of increasing the number of birds on or about our farm lands. While the average number of birds to the acre throughout the country is shown to be two, the number has been increased by the offer of suitable inducements to as many as 59 pairs. At an annual average value of 10 cents each to the farmer, as insect destroyers,—a ridiculously low estimate, the birds of the United States effect a saving of four hundred million dollars every year, and it is readily seen that the more we can attract to our grounds the better.

The usual methods of erecting nest boxes, winter feeding, planting of berry bearing bushes, etc., are mentioned, with references to other available publications on the subject. A novel feature however, is a plea for

[1] Compt. Rend. Soc. Scient. de Varsovie, 1912, V. Ann., fasc. 8. pp. 452–500. [In Polish with condensed reprint in French].

[2] Glimpses of Desert Bird Life in the Great Basin. By Harry C. Oberholser. Smithsonian Report for 1919, pp. 355–366. Washington, Government Printing Office, 1921.

[3] Community Bird Refuges. By W. L. McAtee. Farmers' Bulletin 1239. U. S. Dept. Agr., December, 1921, 8vo. pp. 1–14.

the improvement of roadsides and railroad right-of-ways. "There exists" says the author "in most parts of the United States either a superstition, a conviction, or a legal requirement that roadsides be shorn of their vegetation at least once a year." The result is a dusty, shadeless, uninviting road, which could be remedied by the proper planting and care of trees and hedges, which would be pleasing to the eye and would furnish shelter and nest sites for birds.

Mr. McAtee has prepared a timely and useful pamphlet. A new edition, is we understand, already called for which is encouraging although we fear it will require several of them to overcome the ridiculous notions about clearing the fence rows which are inherent in the minds of the majority of our farmers.

Apropos of popular nomenclature the Biological Survey seems to be establishing another code of names different alike from the A. O. U. 'Check- List' and the idiosyncracies of the Smithsonian Reports. We find "eastern bluebird" used consistently all through this paper though "robin," "hermit thrush," "mockingbird" and "meadowlark" appear without the geographic modifier. If the improvement is desirable in one case, why not in all? "Yellow-shafted flicker" is another vernacular not in the A. O. U. 'Check-List.' These are but minor matters but the constant tendency toward individuality in nomenclature and the ignoring of the once authoritative 'Check-List' are alarming and seem to serve no purpose but to effect ultimate chaos.—W. S.

Wetmore on Body Temperature of Birds.[1]—Few recent ornithological papers contain as much "meat" as is crowded into the fifty odd pages of Dr. Wetmore's treatise on the body temperature of birds. His studies have covered a number of years and with painstaking perseverance he has personally collected no less than 1558 dependable temperature records from recently killed birds representing 327 species and 50 families while compiled data swell the list of species to 406. His records were taken with special self-registering clinical thermometers, carried constantly in the field, ready for instant use, and inserted through the throat or rectum into the body cavity immediately after the bird was shot, later readings being found to be useless.

Dr. Wetmore corroborates the statements that the temperature of a bird increases a few degrees as the day advances and that the temperature of the female is usually slightly higher than that of the male. In the Phalaropes however, he finds that the reverse is true, doubtless correlated with the well-known reversal in the duties of incubation and rearing of the young in these birds. The same reversal of temperatures, however, prevails in the Avocet, and Dr. Wetmore has evidence pointing to the probably assumption of most of the duties of incubation by the males

[1] A Study of the Body Temperature of Birds. Smithsonian Misc. Collns. Vol. 72, No. 22. By Alexander Wetmore. pp. 1–52. December 30, 1921.

in this species, while he has proven this to be the case in the Willet and suspects it in the majority of the shore birds. He finds that the body temperature of birds is apparently quite independent of external temperature, records of the same species in seasons of marked heat or marked cold showing no difference. Systematically, temperatures seem in a general way, to vary from low, in groups regarded as low in the scale, to high, in those which are most specialized, but there are many discrepancies due probably to insufficient data.

Most interesting of all Dr. Wetmore's discussions are those concerning "Method of Temperature Control in Birds" and "Significance of Temperature Control." We can only touch upon a few of the points considered. Birds, as is well-known, possess no "sweat glands," while the feather covering tends to conserve the heat of the body. Their high metabolism —the tremendous development of heat due to the muscular action in flight, demands in the absence of glands, some other method of relief, and this our author considers is found in the air sacks peculiar to birds, which act as the agency of temperature control, a fact first independently discovered by Dr. Wetmore but later elaborated by others.

The difference between "warm-blooded" and "cold-blooded" animals is explained to lie, not in the actual degree of temperature, but in the ability to maintain a more or less uniform body temperature independent of the external conditions. "Cold-blooded" animals, such as reptiles, vary their temperature in direct relation of that of their surroundings and very low temperatures induce torpidity, while "warm-blooded" forms, either by glands in the skin, or the feather coating and air sack system, keep their temperature nearly constant. The origin of the "warm-blooded" condition Dr. Wetmore attributes to the struggle against enforced hibernation.

It is to be hoped that Dr. Wetmore will be enabled to carry on his researches, in this field, as he proposes, until sufficient data are accumulated to demonstrate conclusively many points that are now merely suggested. The possibilities of further study are of the utmost importance and are likely to throw light on taxonomic as well as physiological problems.—W. S.

Bangs on Birds of the American Museum's Asiatic Expedition, of 1916–1917.—The birds collected by Messrs. Andrews and Heller in Burma, Yunnan and Fokien in 1916–1917, when making explorations on behalf of the American Museum of Natural History, have been entrusted to Mr. Outram Bangs for identification and an annotated list of them is presented in the present paper[1]. The new forms described are *Pericrocotus yvettae* (p. 583), Malipa, Burma; *Turdus auritus conquisitus* (p. 591), Snow Mts., Yunnan; and *Megalurus palustris andrewsi* (p. 592), Meng-ting, Burma.

[1] Birds of the American Museum of Natural History's Asiatic Zoological Expedition of 1916–1917. By Outram Bangs. Bull. Amer. Mus. Nat. Hist., XLIV, Art XX, pp. 575–612. New York, December 30, 1921. 8vo.

A new name *Rhipidura flabellifera placabilis* (p. 583) is proposed for *R. f. kempi* Matthews and Iredale of New Zealand, which is preoccupied. The collection contains representatives of nearly 300 species but many of them represented by only one or two specimens, which as Mr. Bangs says renders subspecific determination not always certain.—W. S.

Miller and Griscom on Central American Birds.—This paper[1] includes descriptions of several new birds mostly obtained by the authors on an expedition to Nicaragua in 1917, and here published in advance of their final report. There are also comments on the status of certain other Central American forms. The new Nicaragua birds are *Ortalis cinereiceps saturatus* (p. 1), Matagalpa; *Creciscus ruberrimus* (p. 2) Jinotega; *Gallinula chloropus centralis* (p. 3) Metapa; *Asturina plagiata micrus* (p. 4) Chinandega; and *Ictinia plumbea vagans* (p. 5) Peña Blanca.

Crax panamensis Ogilvie-Grant the authors find indistinguishable from *C. globicera*, every one of the alleged characters being matched in a series of the latter species.

Commenting on Mr. Bangs' review of the Wood Rails of Central America, they fail to find any intergradation between *Aramides albiventris* and *A. plumbeicollis* and regard them as quite distinct species. On their recent expedition, moreover, they found a new race of the latter at Tipitapa, Nicaragua, which is described as *A. p. pacificus* (p. 11). *Aramus vociferus* they divide into two races, the typical form being restricted to Florida and the other *A. v. holostictus* (Cab.) ranging over the Greater Antilles and Central America.

In discussing the status of *Gampsonyx swainsoni leonae* Chubb. the authors' ideas became somewhat involved and a new edition[2] of this note has been issued to be substituted for the original. As we now understand it they recognize *leonae* and *swainsoni* as separable but on different grounds from those given by Mr. Chubb while *meridensis* Swann is regarded as a synonyom of the former.—W. S.

Grinnell and Storer on Yosemite Birds.[3]—The publishers of Hall's 'Handbook of Yosemite National Park' have done well to secure the service of Dr. Joseph Grinnell and his staff of the Museum of Vertebrate Zoology to prepare the chapters on natural history. Too often such work is intrusted to a compiler, with unfortunate results, but in this case the best authorities on the subject have been consulted.

Four chapters have been prepared by Dr. Grinnell and Mr. Storer

[1] Descriptions of Proposed New Birds from Central America, with Notes on other Little-known Forms. By Waldron DeWitt Miller and Ludlow Griscom. Amer. Mus. Novitates, No. 25. December 7, 1921, pp. 1–13.

[2] Errata (undated).

[3] Life Zones of Yosemite National Park. By Joseph Grinnell, Director and Tracy Irwin Storer, Field Naturalist, Mus. Vert. Zool. Univ. of Calif., Hall's Handbook of Yosemite National Park, G. P. Putman's Sons, 1921, pp. 123–132.

dealing with the mammals, birds, reptiles and amphibians and the life zones of the Yosemite. The last explains very clearly the zonal distribution of life and lists the more conspicuous species of vertebrates found in each zone from the Lower Sonoran in the San Joaquin Valley, near Merced, to the Arctic Alpine of the highest Sierran peaks.

The chapter on birds[1] tells us that the "Yosemite section," about the size of the State of Rhode Island, contains 226 different kinds of birds, about 50 of which are briefly described and their characteristic habits mentioned. The selection is very well made and gives a satisfactory picture of Yosemite bird-life. Several half-tone illustrations and a bibliography complete the sketch.—W. S.

Cherrie and Reichenberger on New Birds from Southern South America.[2]—The forms here described are mainly from the Roosevelt collection made by Mr. Cherrie in 1913–1916. They are *Strix chacoensis* (p. 1), Ft. Wheeler, Paraguay; *Ortalis canicollis pantanalensis* (p. 2), Matto Grosso, Brazil; *O. c. grisea* (p. 2), Santiago del Estero, Argentina; *Nystactes tamatia interior* (p. 3); *Nonnula ruficapilla pallida* (p. 4); *Chloronerpes flavigula magnus* (p. 4), all from Matto Grosso, Brazil; and *Furnarius rufus paraguayæ* (p. 5), Puerto Pinasco, Paraguay.

The descriptions are commendably full with discussions of related forms.—W. S.

Murphy and Harper on the Diving Petrels.[3]—In this very carefully prepared monograph the authors reach the conclusion that the Diving Petrels represent but one genus *Pelecanoides* divisible into four subgenera *Puffinuria, Porthmornis* (p. 503), *Pelagodytes* (p. 503)—these two here described as new, and *Pelecanoides* proper. The first three contain but a single species each with no subspecies, but the last contains two species *urinatrix* and *exsul*, the former divisible into five geographic races. The authors are to be congratulated upon their conservatism in the systematic treatment. The habits of these interesting antarctic birds are discussed as well as their probable evolution. Following the principles laid down by Dr. W. D. Matthew for the distribution of mammals, the authors think it likely that the original center of dispersal of these birds was the vicinity of Cape Horn, where we find today the most distinctive species, *P. magellani*. Those on the extremes of the range of the group have many points of resemblance, which would be interpreted by the authors to be due to the retention of primitive nonadaptive characters rather than to close re-

[1] Some Birds of Yosemite National Park. Ibid, pp. 133–152.

[2] Descriptions of Proposed New Birds from Brazil, Paraguay, and Argentina. By George K. Cherrie and (Mrs.) Elsie M. B. Reichenberger. Amer. Mus. Novitates, No. 27. December 28, 1921, pp. 1–6.

[3] A Revision of the Diving Petrels. By Robert Cushman Murphy and Francis Harper. Bull. Amer. Nat. Hist., Vol. XLIV, Art. XVII. pp. 495–554. New York, December 23, 1921.

lationship. There are a number of half-tone illustrations of skins of adults and downy young, nests and eggs, but on the paper used the plates do not show to advantage, though they may be considered more permanent. —W. S.

The Ornithological Journals.

Bird-Lore. XXIV, No. 1. January-February, 1922.

Courtenay Brandreth's Bird Paintings.—By F. M. Chapman.—Besides paying a high tribute to the artist Dr. Chapman takes the opportunity to state some of the requirements of a bird artist, calling attention to the importance of a thorough knowledge of the live bird and concluding with the statement that "no one has ever reached or ever will reach the first rank of bird artists who is not possessed of that keen interest in birds which marks the born ornithologist." Half-tone reproductions of several of Mr. Brandreth's paintings are used as illustrations.

The twenty-second Christmas Census takes up the bulk of the number. The general occurrence of the Northern Shrike in the New England and Middle States is commented upon as well as the large number of species reported from East Goose Creek, Fla., by Ludlow Griscom and M. S. Crosby—109 species, a greater number than from any California locality. The desirability of seeking for numerical records in field list has however been discussed in another connection on page 282 (*antea*).

The educational leaflet by Mr. Pearson treats of the Maryland Yellow-throat, the plate being drawn by Allan Brooks.

The Condor. XXIV. No. 1. January–February, 1922.

The Reddish Egrets of Cameron County, Texas. By J. R. Pemberton. An excellent account with admirable photographs.

Magpies versus Livestock: An Unfortunate New Chapter in Avian Depredations. By S. Stillman Berry.—A valuable account of the attack by Magpies upon sheep and hogs. The author very wisely advises caution in declaring all Magpies to be "vermin" and ordering their extinction, which is far too often the method of procedure in these days. He suggests that the habit is quite possibly acquired by only a few birds and that the killing of those caught in the act may be all sufficient, and again he says that the habit which is now sporadic may die out again without becoming a character of the species.

Notes on the Dipper in Yellowstone National Park. By M. P. Skinner.

Some Birds of Roosevelt Lake, Arizona, By H. H. T. Jackson Notes on thirteen species.

Among the general notes we find one by Dr. Grinnell stating that no less than 205 new species and subspecies of birds have been described from California of which 160 are now regarded as valid.

The Wilson Bulletin. XXXIII, No. 4. December, 1921.

The Nesting of the Duck Hawk in South-Central Wisconsin. By H. L. Stoddard.

Summer Birds in the vicinity of Lake Caddo, Harrison County, Texas. By Alvin R. Cahn.

Comparative Periods of Nestling Life of Some North American Nidicolae. By F. L. Burns (continued.)

Three Spring Bird Lists made near Washington, D. C. By W. L. McAtee.

The Oologist. XXXVIII, No. II. November 1, 1921.

The Brown Creeper [nesting in Pennsylvania]. By R. B. Simpson.

The Oologist. XXXIX, No. 1. January, 1922.

Arkansas Birds. By J. D. Black.—A list of species observed at Wi ıslow, Ark.

Bulletin of the Essex County Ornithological Club. IÎI, No. 1. December, 1921.

Wild Turkey in New England. By Glover M. Allen.—A valuable historical account with notes on the extermination of the turkey and a list of New England specimens extant.

The Status of Certain Ducks at Wenham Lake. By John C. Phillips.

The Terns of Our Coast. By Charles W. Townsend.

How Much do Loons Use their Wings under Water? By E. H. Forbush. A call for more observation on the subject.

Some Buzzard's Bay Birds. By Winthrop Packard.

Also numerous local notes including a record of a specimen of Franklin's Gull (*Larus franklini*) taken at Salem, Mass., October 28, 1885, and now in the Peabody Museum.

The Ibis. (II Series) IV, No. 1. January, 1922.

Notes on Some Birds from the Near East and from Tropical East Africa. By Col. R. Meinertzhagen.—The following are described as new: *Cisticola cisticola annae* (p. 12) Famagusta, and *C. c. berberae* (p. 12) Berbera.

Notes on the Birds of Tsushima and Iki Islands, Japan. By N. Kuroda.—New forms are: *Yungipicus kizuki kotataki* (p. 86); *Monticola solitaria latouchei* (p. 92); *Troglodytes troglodytes utanoi* (p. 96); *Sittiparus varius ijimae* (p. 98); *Periparus ater teraokae* (p. 100); *Garrulus glandarius namiyei* (p. 102); all from Tsushima, *Yungipicus kizuki amamii* (p. 88) LiuKiu Islands and *Y. k. nippon* (p. 88) Hondo.

A Short Systematic Review of the African Francolins. By C. W. Mackworth-Praed.—This is a very careful review of these difficult birds of which the author finds no less than 32 distinct species with 65 additional subspecies probably entitled to recognition. In this connection he shows commendable conservatism in the matter of proposing names for many of the subspecies until adequate series are available. He does however distinguish them by number and gives quite as full diagnoses as are provided by many present day describers of new forms. The only danger in the author's excellent method is that some nomenclatural pirate may take advantage of the materials thus provided and furnish the names that he has wisely withheld!

A Reminiscence of the Last Great Flight of the Passenger Pigeon.

in Canada. By Percy R. Lowe.—Presenting the recollections of Dr. A. B. Welford, of Woodstock, Ontario, of the phenominal flights of 1869 or 1870.

Dr. Lowe adds some comments on the cause of the extermination of the Pigeon. We may consider it, he says, as a race whose germ potency had "outrun the constable" and instead of running to fantastic size as did so many of the doomed reptiles of the past ages "it rioted in a spendthrift revelry of numbers." Or we may surmise that its vital mechanism had burnt itself out or that there was a sudden alteration in sex-ratio. Dr. Lowe however does not believe in a microbe infection or human agency as the cause of the bird's extinction. Others will, he says, dissent from his opinion, and we must, we fear, count ourselves among the dissenters since we regard the record of the destruction of the pigeons by man as quite sufficient to account for the disappearance of such a gregarious species, just as it was in the case of the buffalo.

A Note on Some Oriental Zosteropidae. By E. C. Stuart Baker.—*Z. palpebrosa elwesi* (p. 144) Gunjong and *Z. p. peguensis* (p. 144) Moulmein, and *Z. p. cacharensis* (p. 144) Assam, are described as new.

Some Remarks on the Names of Certain Birds. By C. B. Ticehurst. *Phylloscopus humei* Math. and Iredale should be *P. h. inornatus* (Blyth) which is earlier. *Motacilla flava campestris* Pallas becomes *M. f. flavifrons* Severtsow, being antedated by *M. campestris* Linn. *Phylloscopus indica* Auct. becomes *P. griseolus* Blyth (nec *Sylvia indica* Vieill.) *Alauda arvensis cinerascens* becomes *A. a. dulcivox* Brooks which is earlier.

Notes on Some Indian Wheatears. By C. B. Ticehurst.

The Birds of Spitsbergen and Bear Island. By F. R. C. Jourdain. —Report of the Oxford Expedition No. 1.

Species and Subspecies. By Percy R. Lowe.—A further careful explanation of the author's views on the existance of two kinds of subspecies —mutational and environmental.

Bulletin of the British Ornithological Club. CCLXIII. November 29, 1921.

Mr. W. L. Sclater presents notes on several African Anatidae and proposes *Asio tingitanus andrewsmithi* (p. 24) as a new name for *Otus capensis* Smith, and *Yungipicus obsoletus batesi* (p. 24) for *Dendropicos o. cameronensis*, both being preoccupied. *Tyto alba erlangeri* (p. 24) Arabia is described as new.

Col. Meinertzhagen contends that the characters upon which Mr. Iredale recently separated the Spitsbergen Red Phalarope, (*P. f. jourdaini*) are merely seasonal.

Mr. D. A. Bannerman describes *Tchitrea fagani* (p. 28) from Nigeria. Mr. E. C. Stuart Baker three new forms from India and Mr. J. D. La-Touche nine from Yunnan.

The Tenth Oölogical Dinner was held on September 14, 1921, with an interesting exhibit of eggs of Alcidae and Game Birds.

British Birds. XV, No. 7. December 1, 1921.

On the British-taken Examples of the Levantine Shearwater. By H. F. Witherby.—An examination of a number of specimens seems to indicate that probably all of those taken in British waters are *P. p. mauretanicus* and not *P. p. yelkouan.*

British Birds. XV, No. 8. January 1, 1922.

Nesting of the Whooper Swan in Scotland. By Audrey Gordon.

On the Breeding Habits of the Turnstone in Spitsbergen. By A. H. Paget Wilkes.—A full acccunt with excellent illustrations from photographs.

Another Cuckoo Record. By J. Scholey.—An exceedingly interesting contribution to the life history of this remarkable bird. The individual female under observation laid its eggs exclusively in the nests of the Reed Warbler—six in 1919, sixteen in 1920 and nineteen in 1921. In nearly every instance she removed an egg of the Warbler when depositing her own. She was attended by two males and when one of them accompanied her to a nest the author considered it to be for protection as the male drew the attention of the owners of the nest away from the female.

British Birds. XV, No. 9. February, 1922.

Observations of the Breeding Habits of the Merlin. II. Incubation. By W. Rowan.

Revue Francaise d'Ornithologie. No. 152. December 7, 1921. [In French].

Dr. Millet Horsan describes as new *Phalacrocorax africanus menegauxi* (p. 177) and *Halcyon torquatus pontyi* (p. 178) both from Togo, and continues his popular account of the birds of Africa.

Revue Francaise d'Ornithologie. No. 153. January 7, 1922. [In French.]

On the Spring Migration at Charente. By J. Delamin.

Le Gerfaut. XI, No. 3–4. 1921. [In French.]

Fauna of Belgium. The Eagles. By G. van Havre.

Numerous local notes.

L'Oiseau. 11. November, 1921. [In French.]

The rearing of Bulbuls, Ganga Cockatoos and Hemipodes is discussed by several writers.

Ardea. X, No. 2–3. [In Dutch.]

The Migration of Birds. By E. D. VanOort.—An historical resume.

Results of Bird-banding by the Leiden Museum. By E. S. VanOort.

Ornithological Notes from Spitsbergen and Scandinavia. 1921. By G. J. VanOordt.—An extensive paper in English with illustrations of various birds and nests from photographs. Most interesting are some views of the Red-throated Loon on its nest. The author was in Spitsbergen simultaneously with the Oxford University Expedition and met them in the field.

Further Additions to our Knowledge of the Avifauna of Eastern Sumatra. By L. F. DeBeaufort. [In English.]

This excellent number contains also an account of the meetings of the Netherlands Ornithological Society and many local notes among which is a record of a hybrid duck.—*Nettion crecca* × *Dafila acuta.*

Yearbook of the Netherlands Ornithological Club. II, No. 3–4. [In Dutch.]

Nesting of *Motacilla flava rayi* in the Netherlands.

Ornithology of the Netherlands. Observations October 1920–September 1921. By Snouckaert van Schouburg.

The South Australian Ornithologist. VI, No. 4. October 1, 1921.

Notes on Birds met with During a Visit to South-western Queensland. No. III. By A. Chenery.

Journal für Ornithologie. 69, Heft 1. January, 1921. [In German.]

Report on the 1919 Observations at Rossiten. By J. Thienemann.

New Birds from Cameroon. By A. Reichenow.—Thirteen new species and three subspecies.

Journal für Ornithologie. 69, Heft 3. July, 1921. [In German,]

Birds of Ukerewe Island, Victoria Nyanza. By H. Grote. (See review January, Auk.)

The Birds of Prey of Egypt. By A Koenig.

In the proceedings of the German Ornithological Society Reichenow describes *Crateropus plebeius elberti* (p. 461) from East Cameroon.

Journal für Ornithologie. 69, Heft 4. October, 1921. [In German.]

The Latest Results of Bird Migration Investigation in North America. A Critical Review. By W. R. Eckardt.— Considers mainly the work of the late Prof. Cooke.

On the Color Sense of Birds. By H. Krohn.

The Numerical Relationship of the Species in Bird Hybrids. By H. Poll.—A long list of hybrids the characters of which are indicated by the author's method.

Menzbier and Schnetrukow, describe *Podoces panderi ilensis* (p. 528) from Semerjetschje.

Ornithologische Monatsberichte 30, No. 1. January–February, 1922. [In German.]

With this issue Dr. E. Stresseman becomes the editor, taking the place of Dr. Reichenow, the founder of the journal and editor for nearly thirty years.

E. Stresseman describes four new birds from New Guinea and New Pomern.

Ornithologische Beobachter. XIX, No. 3. December, 1921. [In German.]

Ornithological Notes from the Region of the Bosphorus. By A. Mathey-Dupras (continued in the next issue).

Ornithologische Beobachter. XIX, No. 4. January, 1922. [In German.]

The Hazel Hen. By F. Kaiser.—Illustrations of nest and eggs.

Ornithological Articles in Other Publications.[1]

Ewart, J. Cossar. The Nestling Feathers of the Mallard, with observations on the Composition, Origin, and History of Feathers. (Proc. Zool. Soc. London. September 1921. pp. 609–642.)—An exceedingly interesting paper and probably the most important contribution to the subject that has appeared. The author's conclusions are that feathers did not arise from scales for the purpose of flight, but that the primary covering of birds consisted of various kinds of simple filaments which later developed into protoptiles or preplumula the former of which in some cases soon acquired the chief characteristics of true feathers. The progress of development was then arrested in order to provide birds with a fur-like coat to protect them from the cold of the Ice Age, which having passed the mesoptiles were superseded by true feathers which became specialized along the posterior margin of the hand and fore arm and the sides of the tail, making flight possible. We wonder if the author is familiar with the work of the late William Palmer some of whose notes on "down feathers" are published in the U. S. Fur Seal Report of 1899, Vol. III. These notes are unfortunately often overlooked on account of being buried in a volume where they would hardly be looked for.

Van Sommern, V. G. L. On a Collection of Birds from Turkanaland (Jour. East African and Uganda Natural History Society. No. 1, 16, February 1921, pp. 3–38).—186 species listed and briefly discussed, the new forms having already been described in the 'Bull. Brit. Ornithological Club.' There is an introduction describing the country and the itinerary of the expedition which made the collection.

Kloss, C. Boden. A Further Note on the Red Jungle Fowl. (Records of the Indian Museum, XIX, Pt. IV, November 1920.)—In this contribution to the controversy regarding the proper name for the Jungle Fowl the writer finds evidence of the occurrence of the bird in a wild state in Pulo Condore, to which locality Linnaeus refers, and which must become the type locality, rather than Bengal as fixed by Bangs and Penard. We think Mr. Kloss in error, however, in refusing to accept the Linnaean name, *Phasianus gallus*, because in the 'Fauna Suecica' it had been used for the domestic bird. Neither do we think that the fact that the name *bankiva* is of Javanese origin fixes the type locality of the race so named as Java, when Bangs and Penard have definitely selected Sumatra.

Fletcher, J. J. The Society's Heritage from the Macleays. (Proc. Linnaean Society of New South Wales, XLV, Pt. 4, 1921, pp. 567–635).—A valuable historical account of the early development of science in Australia.

Lovenskiold, Herman L. A Contribution to the Avifauna of Jaedern. (Aarshefte, Stavanger Museum, 1918–19, pp. 3–21.) [In Scandinavian]—An annotated list of 71 species, 66 of which, as one might expect in a Scandinavian locality, bear Linnaean names.. There are half-tone figures of nests and eggs of various species.

Following this paper are several colored plates of hybrids between *Lyrurus tetrix* and *Lagopus*.

Ogilvie-Grant, W. R. Guide to the Gallery of Birds, British Museum (Natural History)—A descriptive account of the principal types of birds of the world in systematic order with an appendix on the structure of birds and an atlas of 24 plates of mounted specimens and groups.

Allen, Amelia S. The Birds of the Berkeley Campus. (Univ. of California Chronicle, January 1922, pp. 89–106.)—A very pleasing popular account of the common birds of Berkeley, Calif., their songs and identification marks. The list includes 122 species; 36 residents, 32 winter visitants, 20 summer visitants and 34 transients. Incidentally the statement that "a hawk is already a *rara avis* east of Ohio" will hardly be accepted by eastern ornithologists. There are many times and places where hawks are still abundant in the east, as for instance at Cape May, N. J., where in September the annual slaughter of several thousand Sharp-shins does not seem to affect the swarms that still come down the coast.

McClelland, Dr. and Mrs. W. C. Notes on the Birds of the Vicinity of Washington, Pa. (American Midland Naturalist, VII, 1922, pp. 35–38). About 100 species seen in ten years. Popular notes on the common species. "Brown-breasted Nuthatch" is evidently a misprint and "Chickadee" should be Carolina Chickadee.

Pohlman, A. G. Have Birds an Acute Sense of Sound Location? (Science, May 6, 1921.)—Suggests that the confluence of the middle ear cavities in birds may result in greater ability to locate sound. Note by Joseph Mailliard on the same subject, Ibid., February 24, 1922.

Rockwell, R. B. and **Blickensderfer, C.** Home Life of the Saw Whet Owl. (Natural History, XXI, No. 6, Nov.–Dec., 1921. pp. 627–638.) An excellent intimate study of this little owl at Golden, Colo., with 18 admirable illustrations from photographs.

Meinertzhagen, R. A Preliminary Study of the Relation between Geographical Distribution and Migration, with Special Reference to the Palaearctic Region. (Smithson. Report for 1919, pp. 339–348.) Reprinted from 'The Ibis,' 1919.

Collinge, W. E. The Necessity of State Action for the Protection of Wild Birds. (Ibid. pp. 449–353.) Reprinted from 'The Agricultural Magazine,' May, 1919.

Lima, Joao Leonardo. Birds Collected in the States of S. Paulo, Matto Grosso and Bahia (Brazil) with some New Forms. (Rev. Mus. Paulista, XII, 1920, pp. 93–106.) [In Portuguese.]—The new forms are: *Picunnus* [sic] *lepidotus corumbanus* (p. 94), Corumba; *Xiphocolaptes albicollis belmontensis* (p. 102), Belmonte, Bahia; *X. a. villadenovae* (p. 104), Villa Nova, Bahia; *Campylorhamphus trochilirostris intermedius* (p. 103). Ilheos, Bahia; *Sporoptula* [sic] *sertanicola* (p. 105), Serra do Cubatao, S. Paulo. On the colored plate of the new forms which accompanies the paper the misspellings noted above are corrected and the second race of *Xiphocolaptes* appears as *villanovae*.

Rabeiro, Alipio de Miranda. Revision of the Brazilian Parrots. (Ibid, pp. 1–82.) [In Portuguese.]—The following new genera are proposed: *Hemipsittacus* (p. 7) for *H. severa*; *Propyrrhura* (p. 7) for *P. maracana*; *Gymnopsittacus* (p. 9) for *G. wedelli; Proconurus* (p. 21) for *P. nobilis* (p. 21); *Chapmania* (p. 65) for *C. barrabandi*; and *Salvatoria* (p. 68) for *S. xanthops.*

Forbush, E. H. Bird Guardians of the Trees. (American Forestry, XXVIII, pp. 159–164.)—Many beautiful photographs by Cordelia J. Stanwood.

Lecaillon, M. A. On the Characters of a Hybrid between *Cairina moschata* and *Chenalopex aegyptiacus.* (Compt. Rend. Acad. Sci. Paris, 174, No. 1. pp. 68–69.) [In French.]

Le Souef, A. S. Notes on the Breeding of the Scrub Turkey. (Australian Zoologist, 1, pt. 8, p. 251.)

Froggatt, Walter W. The Wedge-tailed Eagle (Ibid, pp. 251–254).

Boettger, C. R. My Expedition to the Spanish Colony, Rio de Oro, in West Africa. (Bericht Senkenb. Naturf. Gesell., 51, heft 1, pp. 18–31. 1921, and heft 2, pp. 72–84.) [In German.]—Some general account of the birds.

Schnurre, Otto. The German Bird Fauna in its Relation to Man's Colonization (Ibid. heft 1, pp. 13–17). [In German.]

Evans, William. Edinburgh Rookeries in 1921. (Scottish Naturalist, No. 121–122, Jan.–Feb. 1922, pp. 9–12).—Fourteen rookeries, 1545 nests.

Wild, Oliver H. A Scottish Method of Bird-Catching. (Ibid., pp. 13–15.)—Also other comment on the widespread trapping of native birds for caging.

Shipley, Sir Arthur E. The Danger to Fish and Bird Life from Oil-Driven Ships. (The Landmark, III, No. 5, May 1921.)—A strong plea for discharging oil far from shore. The constantly increasing damage to birds along our coasts is becoming a serious matter. On the Scottish coast over 300 dead or disabled Kittiwakes and a similar number of Razorbills were counted in a single day, and the same thing occurs on the American coast.

Racey, K. Notes on the Northwest Coast Heron in Stanley Park, Vancouver, B. C. (Canadian Naturalist, September 1921.)

Nice, Margaret M. Some Experiences with Mourning Doves in Captivity. (Univ. of Oklahoma Bulletin, No. 220, July 15, 1921.)

Riddle, Oscar. A Simple Method of Obtaining Premature Eggs from Birds (Science, Dec. 30, 1921).—The importance of obtaining immature eggs for certain biological investigations has seemed to justify the occasional killing of the female bird, but it is now found that therapeutic doses of the posterior lobe of the pituitary body cause the premature discharge of the egg before the shell is formed. It is usually the eggs of the Common Fowl or Pigeon that are used, but should this practice be extended to the eggs of wild birds, we can imagine the horrified protest of oölogists who, despite their name, are not much concerned with the egg proper as compared with the shell!

Additional Publications Received (up to March 20).

Chapman, F. M. The Distribution of the Swallows of the Genus *Pygochelidon* (Amer. Mus. Novitates No. 30, Feb. 28, 1922).

Chapman, F. M. Descriptions of Apparently New Birds from Colombia, Ecuador and Argentina (Amer. Mus. Novitates, No. 31, March 2, 1922).

Hewitt, C. Gordon. The Conservation of the Wild Life of Canada. Chas. Scribner's Sons, 1921.

Kutchin, Victor. What Birds have Done with Me. Richard G. Badger. The Gorham Press.

Lucanus, Frederich von. Die Rätfel des Vogelsuges. H. Beyer & Son. Langensalza.

Mathews, G. M. The Birds of Australia. Vol. IX, Pts. 5 and 6.

Witherby, H. F. A Practical Handbook of British Birds, Part XIII. Feb. 16, 1922.

Beebe, William. A Monograph of the Pheasants. Vol. III.

Avicultural Magazine. XIII, Nos. 1 and 2, January and February, 1922.

Bird Notes and News. IX, No. 8.

British Birds. XV, No. 10. March 1, 1922.

Bulletin British Ornithologists' Club. CCLXV, CCLXVI.

California Fish and Game. VII, No. 4, VIII, No. 1.

Emu, The. XXI, Pt. 3. January, 1922.

Fins, Feathers and Fur. No. 28, December, 1921.

Journal für Ornithologie. 70, Heft 1. January, 1922.

L'Oiseau. II, No. 12, III, No. 1, December 1921, and January 1922.

Oologist, The. XXXIX, No. 2. February, 1922.

Ornithologische Beobachter, XIX, No. 5.

Provencher Society of Nat. Hist. Annual (?)

Philippine Journal of Science. 19, Nos. 1–4, July–October, 1921.

Proceedings Acad. Nat. Sciences Phila. LXXIII, Pt. 2.

Revue Francaise d'Ornithologie. 14, No. 154.

South Australian Ornithologist. VI, Pt. 5.

CORRESPONDENCE.

Bird Counts.

Editor of 'THE AUK.'

The Biological Survey began in 1914 to collect data on the numerical distribution of bird life in the United States. By such information, which is gained through counts made by volunteer collaborators, of the birds breeding on selected areas, it is possible to gain some knowledge of the yearly fluctuations in bird life and of the effect the present State and Federal laws may have on the increase of game and insectivorous birds. During the earlier years we received a very gratifying response to our request for assistance, but during the war many persons were unable to continue the work and interest in it has seemed to wane. It is desirable that these counts should be repeated on a large scale through a period of years in order that adequate data may be accumulated to make possible definite conclusions. Any one thoroughly familiar with the breeding birds of his vicinity can do this work, and will find it growing in interest from year to year. We are therefore again appealing to the readers of 'The Auk' in the hope that all who are able to do so will make one or more bird counts this summer.

The general plan of this work is to select a tract of land containing from 40 to 80 acres and representing as nearly as possible the average conditions for the vicinity. Some day during the height of the breeding season, this land should be carefully gone over in the early morning and the male birds counted, which at that season are usually in full song and may be considered each to represent a breeding pair. The result of this count should be checked subsequently to be sure that all birds counted nest within the selected area, and that none have been missed. The count should not be made until the spring migration is over and the birds are settled on their nesting grounds. In the latitude of Washington, D. C., the best time for the first count is about the first of June, in New England and the northern states probably about June 10; and south of Washington, during the latter part of May.

Anyone who is willing to do this work is requested to send his name and address to the Biological Survey, Washington, D. C. Full directions for making a count and report blanks will be sent in time for plans to be made before the actual time for the field work. Since the Bureau has no funds with which to pay for this work, it must depend on the services of voluntary observers.

An added impetus should be given to this work at the present time by the report that the British ornithologists are contemplating a census of the birds of the British Isles, planned along the same lines as our own.

Very truly yours,

E. W. NELSON,

Chief, Biological Survey.

Washington D. C.
February 1, 1922.

Inner Primaries of Woodpeckers.

Editor of 'THE AUK:'

In my recent article on the "Inner Primaries of Nestling Woodpeckers," I stated (Auk, 1921, p. 532) that so far as I was informed no writer had yet remarked upon their peculiarities. As so often happens, I was not aware of a note published in the Journal für Ornithologie, 1916, pp. 155–156, by Dr. A. Heinroth, wherein the conditions in the young of *Jynx torquilla*, *Dryobates minor*, and *Dryocopus martius* are fully and accurately described. My attention has just been called to this previous publication by Dr. E. Stresemann.

As might be gathered from the opening sentence of my article, I still claim priority for my investigations, since they were begun in the Belgian Congo in 1911, and taken up again in the United States in 1915. But had I read Dr. Heinroth's excellent account of his discovery, I should not have failed to give him full credit.

It is of special interest to note that the young Wryneck resembles the Woodpeckers. With regard to the Indicatoridae, I have recently ascertained that in at least two species (*Indicator conirostris* and *Melicheutes robustus*) there is no reduction of the inner primaries in nestlings.

Very sincerely yours,

JAMES P. CHAPIN.

Amer. Mus. Nat. Hist.
New York, March 21, 1922.

NOTES AND NEWS.

THOMAS HOOPES JACKSON, an Associate of the Union since 1888, died at his home in West Chester, Pa., on February 27, 1922. He was born just north of the borough of West Chester on October 29, 1848, the son of Halliday and Caroline Hoopes Jackson, and one of a family of six children. He spent his entire life in West Chester, being connected with the West Chester Wheel Works, which he entered as a young man. He married in 1887, Miss Ella A. Scarlett, and had one son T. Harold Jackson, of Trenton, N. J. He was a member of the Society of Friends and took an active interest in the North High Street Meeting in West Chester.

From early youth Mr. Jackson was interested in nature and especially in birds, an interest doubtless derived from the practice of the Friends of cultivating the natural sciences, and also from the works and traditions of the many early ornithologists who lived in or near West Chester—Dr. Michener, Vincent Barnard, Josiah Hoopes, etc. Mr. Jackson's specialty was the collecting of eggs and he was known by correspondence to oölogists in every part of the country. His collection was an exceptionally fine one, as he endeavored to make it representative and instructive without

unnecessary duplication. Mere wealth of numbers meant nothing to him. He was however by no means only a collector of eggs but a local ornithologist of the highest attainments, and a bird photographer of ability. No one knew the birds of the vicinity of West Chester better than he, and he was always ready to place his knowledge at the disposal of any one who might be in a position to use it. His modesty and generosity indeed kept him from attaining the reputation to which his knowledge of birds entitled him.

His first paper was an account of the nesting of the Worm-eating Warbler published in the 'American Naturalist' for December 1869, the first accurate account of the nidification of this species. Dr. Brewer republished the note in the 'History of North American Birds' with additional information, obtained, he says, from "the same observing ornithologist."

Later papers were published in 'The Ornithologist and Oölogist,' 'The Oölogist,' 'Cassinia,' 'The Auk,' 'Bird-Lore,' etc. Unfortunately these were not as numerous as they might have been had he not always hesitated to publish for fear what he had to say might not be worth while.

Mr. Jackson was deeply interested in bird protection, not only in better legislation in his own State, but also in establishing reservations on Wallop's Island, Va., and at Orange Lake, Fla.

He was one of the original Corresponding Members of the Delaware Valley Ornithological Club, and often attended the meetings at the Academy of Natural Sciences at Philadelphia, while he was at the time of his death the president of the West Chester Bird Club, an organization in which he took the deepest interest.

Those who knew him best appreciated his delightful companionship, his strong friendship and his deep love of all nature.—W. S.

THE PLATE in the October 'Auk' representing a flight of the Passenger Pigeons from a painting, from memory, by Mr. Frank Bond, which was exhibited at the Washington meeting of the A. O. U. in 1920, has caused much comment.

A number of members of the Union state that as they remember the flights they were more in the form of long streams and not on a broad front as Mr. Bond remembers them in Iowa. As the matter is of considerable importance we present an extract from a letter from Mr. Wm. B. Mershon with which the comments of our other correspondents agree. He says: "How Pigeons may have flown out in Iowa, where there were no trees, I do not know, but they had no such flight as this picture depicts here in Michigan. They strung out and did not fly in company front. In their migrating flight where large quantities of them were passing, they would frequently fly in two or three layers taking different air strata, so that sometimes there would be as many as three deep, one above the other, separated by thirty or forty feet of air space. There was pretty nearly a steady stream, one flock overlapping the other. Each flock bunched

in a sort of head and then gradually got thinner and strung out into a few birds where it would be overlapped from either above or below or along side by another oncoming bunched-headed flock. When flying to their feeding grounds the flocks were smaller than when they were on migration."

A TOTAL of 66,793 canaries were imported into the United States during the past fiscal year under permits issued by the Biological Survey, United States Department of Agriculture. The number of permits issued during the year authorizing the importation of foreign birds and animals increased more than 20 per cent. or from 453 to 560.

Altogether there were entered into the United States under permit a total of 182,052 birds during the year, the figures including 22,209 quail. In addition there were entered at San Francisco, chiefly as passengers' baggage without requirement of a permit, 875 parrots, 1,740 canaries, and 1,989 miscellaneous birds.

Rare birds imported included two Blue Birds of Paradise, four Count Raggi Birds of Paradise, twenty-one Satin-bower Birds, two New Guinea Mynahs and rare Toucans, Parrots and other species from South America.

AUTHORITY to collect migratory birds for scientific purposes was issued to 886 persons by the Bureau of Biological Survey of the United States Department of Agriculture during the past fiscal year. In addition, 160 persons were authorized to possess migratory birds for such purposes, and 48 were authorized to capture migratory water fowl to assist them in breeding wild fowl for domestication. The possession of migratory water fowl for propagation purposes was authorized also by the bureau in 2,139 instances.

Only a small percentage of the persons to whom permits to propagate wild fowl were issued are engaged in breeding the birds for food purposes, many of the birds being held merely for ornamentation or for use as decoys. Permits were issued by the bureau to 150 responsible persons authorizing them to trap, band, and release migratory birds in cooperation with the Government's efforts to obtain scientific data concerning distribution, breeding habits and times and kinds of migratory flight of the birds.

IN MAKING the announcement that the National Association of Audubon Societies had just received a cash contribution of $200,000.00, T. Gilbert Pearson, President of the Association, states that this is the largest of numerous donations, which through the years have been received from the same source.

This friend began by making modest gifts to the work, and his interest has increased as time has gone by.

It is an interesting and encouraging fact that the best supporters of the National Association of Audubon Societies are those who have had opportunity longest to watch its activities. The present gift was made upon condition that the donor's name should remain anonymous. This

sum will be added to the permanent Endowment Fund now totalling $675,000, and will enable the Association to enlarge its activities along the lines specified by the giver, which are as follows:—

1. For the education of the general public in the knowledge and value of useful, beautiful and interesting forms of wild life, especially birds.

2. For the actual protection and perpetuation of such forms of wild life on suitable breeding and other reservations.

3. For protecting and maintaining adequate protection for such forms of wild life in all parts of the Western Hemisphere.

4. Or for any one of these purposes.

The Society was already making arrangements to enlarge its bird and game reservation activities, especially in the southern states and to increase its educational work among children.

WE LEARN from 'Science' that the objects of the recently organized New England Bird Banding Association will be the organization of a regional association of bird banders, from an area possessing one or more migration highways, along which trapping stations could be established, and by intensive attack, to furnish fairly speedy answers to certain specific migration problems. This will demonstrate the scientific value of bird banding and furnish a stimulus to continue the work which it is expected will ultimately solve many ornithological riddles, aid in the solution of others and create new problems not now anticipated.

By having the members meet together as often as possible to discuss results, methods and future plans and to gather inspiration from their fellows after the manner of scientific societies generally, the combined knowledge of the Association will be used to advance the work.

An appeal will be made for the support of Audubon Societies all over the country on the ground that bird banding is a bird-protection movement, since to an important extent, it will be possible in the future to substitute an examination of a live bird for the study of a dead one.

The permanence of the movement will be assured so far as possible my means of institutional trapping stations operated by or in connection with Audubon Societeies, Natural History Societies, Bird Clubs, Departments of Ornithology or Zoölogy at colleges and universities, Bird Sanctuaries, State and National Parks, etc., in addition to stations operated by individuals.

A convenient local depository of all bird-banding records made by members will be established in appropriate quarters where they may be studied by members of the Association and others, an exact copy being sent to the Biological Survey.

COMPLETE SETS of 'THE AUK.' Since attention has been called to the number of complete sets of 'The Auk' much interest has been aroused in building up sets and in securing volumes needed to fill gaps in imperfect sets in public and private libraries. During the past year several sets have

been on the market, some have changed hands, and in a few cases members have been able to obtain the volumes necessary to fill out their sets. Since the appearance of the last list ('Auk,' April 1921, p. 319), fifteen additional sets have been reported. Four of these are in public libraries, the others in private hands; nine are in the United States and six in foreign countries. These additions bring the total numbers of complete sets now known up to 190 of which only 77 are in public libraries. Recently the owners of 5 sets—J. A. Allen (2), John Lewis Childs, Chas. B. Cory, and W. H. Fox—have died and their sets may or may not be continued. One of the Allen sets is now in the possession of H. L. Ferguson, Greenwich, Conn., and the Childs set has been acquired by Charles J. Werner, New York City. Following are the additional sets reported during the past year:—

California
Scripps Biological Station, La Jolla — Tracy I. Storer, Berkeley
Donald R. Dickey, Pasadena (one number missing)

Maine
H. H. Johnson, Pittsfield

New York
Charles J. Werner, New York City — R. S. Williams, N. Y. Botanical Garden

Ohio
S. Prentiss Baldwin, Cleveland

Illinois
Robert Ridgway, Olney.

Oklahoma
J. E. Hallinen, Cooperton (two numbers missing)

Canada
John S. Dexter, Saskatoon, Sask. — J. L. Keays, London, Ont.

France
Jean Delacour, Châtean de Clére, Seine Inferieure

Germany
K. Zool. Museum, Berlin — Museum Zool. Statts Sammlung, Munich

Holland
Royal Museum Natural History, Leiden

T. S. Palmer.

A recent decision in the United States District Court for the northern District of Georgia definitely established the fact that Doves are migratory birds according to the Treaty between the United States and Great Britain and that their killing is therefore forbidden.

At the Annual General Meeting of the British Ornithologists' Union held March 8, 1922, Dr. W. H. Osgood and Mr. W. DeWitt Miller were elected Foreign Members and Major Allan Brooks a Colonial Member.

The Godman-Salvin Medal was awarded to Dr. Wm. Eagle Clarke in recognition of his work on bird migration.

THE Annual Congress of the Royal Australasian Ornithologists' Union was held in Sydney, Australia, October 6–20, 1921. A scheme for several classes of members somewhat like that in force in the A. O. U. was suggested. The present officers were reelected.

THE THIRD volume of Beebe's 'Monograph of the Pheasants' reached us as this issue was going to press and will be reviewed in July. It covers the Cheer, the Koklass Pheasants, the genus *Phasianus*, etc. The treatment is uniform with that of the preceding volumes.

AT THE ANNUAL dinner of the Wilderness Club of Philadelphia on March 25 the members and guests enjoyed the first exhibition in America of the motion pictures of African Wild Animals and birds taken on the expedition of the Crown Prince of Sweden. The exhibition was made possible through the generosity of Mr. Frank A. Tichenor, owner of the films and the enterprise of the President of the Club, Mr. Alfred M. Collins. Among those present were many of the leading big game hunters of America, as well as Dr. E. W. Nelson, President of the American Association of Mammalogists and Dr. Witmer Stone, President of the American Ornithologists' Union. All united in the opinion that these are the most marvellous motion pictures of African animals, yet taken. From the ornithologists' standpoint the flocks of Oxpeckers feeding on the backs of Zebras, Rhinos, Wart-hogs, etc., the melee of Griffon Vultures, Adjutant Storks and Eagles tearing up a dead Zebra, and the flocks of sand grouse were intensely interesting, illustrating the actions of these species, as though the observer was but a few feet away. The closeup views of the giraffes, zebras and a feeding leopard were even more remarkable.



truly yours
W. Palmer

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IN MEMORIAM: WILLIAM PALMER.

BORN AUGUST 1, 1856—DIED APRIL 8, 1921.

BY CHARLES W. RICHMOND.

Plate X

WILLIAM PALMER, a Fellow of the American Ornithologists' Union since 1898, and a veteran field naturalist of Washington, died in Bellevue Hospital, New York City, on April 8, 1921, in his sixty-fifth year. Born at Penge, a civil district in the south of London, on August 1, 1856, the son of Joseph and Letitia (Griffen) Palmer, he spent the first twelve years of his life in that vicinity. His father, who was born at Barrow, Suffolk, England, in 1836, followed the art of taxidermy from early manhood, was a skilled modeler, and excelled in the making of plaster casts, and the coloring of reproductions, and similar work. He was engaged for several years at the Crystal Palace, in Sydenham, not far from Penge, assisting Prof. B. Waterhouse Hawkins with his celebrated restorations of extinct animals. William Palmer, as a small boy, used to visit his father's working quarters, where he came into contact with men whose wisdom impressed him strongly, and whose learning he longed to emulate. It was doubtless at this early period, and under these influences, that his thoughts were

directed into scientific channels and especially toward natural history; in any event, his interest in nature dated back to very youthful days. Little additional information concerning his early life is available to the writer, except that he went to school in season and undertook odd jobs of work in his leisure moments, after the habit of boys. Prof. Hawkins, who had received a commission to produce similar restorations for Central Park, in New York City, came to this country in 1868, accompanied by Joseph Palmer and his family, consisting of his wife, son William, and a daughter, Mary. The elder Palmer continued to assist Prof. Hawkins with his restoration work until the project was abandoned, after which he obtained a position as taxidermist at the Park, serving also as general assistant at the museum, and for a time was in charge of the zoological garden. In 1873, he came to Washington, and secured a position as taxidermist and modeler at the National Museum, a position held by him (with slight alterations in title) until the time of his death, in 1913, although in later years his work consisted almost exclusively of reproductions of ethnological groups and figures. He was especially adept in the modeling of animal and Indian lay-figure groups, and made many of those sent to the various expositions, beginning with the Centennial at Philadelphia, in 1876.

With his early youth spent in an environment of taxidermy and modeling, of museum preparatory work, and matters connected with the installation of museum exhibits, it was not unexpected that in time William Palmer would drift into this character of work, although, as it happened, this result was not reached through his own ambition and efforts. He aimed at higher fields of endeavor, and after attending school in New York City, began a course in medicine, or of study incident to it, but lacking funds to continue it and receiving no encouragement or assistance from his father, he was forced to abandon his plans. When the family removed to Washington, young Palmer secured employment with a mercantile firm on Seventh Street, where he found the work to his liking. The elder Palmer, however, was determined to have the son follow in his footsteps, and soon found a vacancy for him at the National Museum. Accordingly, in the year 1874,

young Palmer was obliged to give up his congenial position, and reluctantly entered the service of the Museum as an assistant in modeling and taxidermy. He served thus for several years, under the tutelage of his father, working at various branches of the preparator's art, such as the molding and casting of reptiles, fishes, antiquities, the preparation of papier-maché models of Moqui and Zuni towns, and similar work. In a short time he was prepared for larger and more important undertakings, and in the spring of 1883 was sent to New Haven with the object of making large paper models of the giant squid and octopus, for display at the Great International Fisheries Exhibition in London. These were later shipped to Washington and installed in the National Museum, where they still remain. In October of the same year he was sent to Barnegat City, N. J., where he made a mold of a rare bottle-nosed whale, and preserved its skeleton in perfect condition.

In the autumn of 1885 Palmer married Miss Arminia Knowles, of Washington, who proved a faithful and devoted wife. Although sharing in no way her husband's interests in natural history, Mrs. Palmer always yielded to his plans when proposed expeditions threatened to upset their home life for extended periods.

In the summer of 1887, Messrs. Lucas and Palmer were detailed by the Museum to accompany the U. S. Fisheries schooner "Grampus" on a notable visit to Funk Island, with the particular object of securing remains of the Great Auk. Their success in this quest is well known. In addition to stopping at Funk Island, the vessel touched at several points on the coasts of Newfoundland, Labrador, and New Brunswick, where many specimens of various kinds were collected. Of the birds obtained on this cruise, Dr. Lucas reported on the remains of the Great Auk, and Mr. Palmer gave an account of the living species.

In April, 1890, Palmer was "instructed to proceed to the Pribylov Islands, Alaska, to hunt walrus for the Museum," and by the middle of May was at Unalaska, on his way to the Islands. He had the good fortune to meet with these rare animals, and to observe them at close range, but under conditions that did not admit of retrieving them if shot. A fine bull was, however, subse-

quently killed by officers of the Revenue Cutter, and Palmer was enabled to carefully study the fresh animal and to prepare its skin, which was later mounted under his direction at the Museum, where it still occupies a prominent place in the exhibition series of mammals. That he was not idle on this trip is attested by a collection of over a thousand specimens, representing many branches of natural history, secured during the three months he was in Alaskan waters. On the Fourth of July, he shot an Asiatic cuckoo on St. Paul Island, the first, and to date the only record for the genus and species in North America.

In an historical sketch of the progress of taxidermy at the National Museum, and of the opportunities afforded by the Museum in its earlier years for the development of artists in this class of work, the late Dr. G. Brown Goode wrote, with especial reference to exhibits prepared for the World's Columbian Exposition, "Mr. William Palmer, now chief taxidermist of the Museum, also received his first training during these years, and began a career which has resulted in the production of such remarkable work as the group of Caribou, prepared especially for Chicago, which, in the judgment of the writer, have not been surpassed anywhere, marking as they do the highest attainment in the imitation of nature, with that combination of life with perfect repose, which is the supreme test of merit in taxidermy." With reference to exhibits prepared for the same exposition, he observed, "A new feature in these groups was the introduction of natural leaves, grasses, plants, and sea weeds, prepared by a process invented and satisfactorily carried out by Mr. William Palmer. Vines with leaves and tendrils which had never been detached from the natural stalk, and other similar accessories, were used, producing effects which could not be obtained by artificial leaves fastened on artificial stems."

Palmer was sent to Chicago, to assist in installing some of the exhibits at the World's Fair, and later served in the same capacity at the expositions held in Nashville, Portland, and elsewhere. These several visits gave him an opportunity to add to his collections, and particularly to increase his botanical material.

Late in 1899, an archeological expedition was projected by Dr.

Edgar J. Banks, of Cambridge, Mass., with the object of making excavations at the supposed site of Ur, in ancient Chaldaea, situated at or near the present town of Mugheir, on the Euphrates River. The National Museum was invited to detail one of its employees to accompany the expedition for the purpose of making natural history and ethnological collections. Palmer was chosen as the Museum representative, and made preparations for a lengthy trip, even going to the extent of disposing of his household goods, and storing his collections and personal belongings. The director of the expedition went to Constantinople to secure the necessary permits and to arrange other details. Many vexatious delays were encountered, extending well into the year 1901, but the long expected firman was never granted and the project was reluctantly given up. While the Ur negotiations were still pending, Messrs. Palmer and J. H. Riley were detailed by the Museum to visit Cuba, where they spent several months, from February to August, 1900, chiefly in Pinar del Rio province, making general collections of animals and plants. Two years later, Palmer, in company with a local botanist, visited the eastern end of the same island, where further collections were made.

In the spring of 1903, Messrs. Lucas, Palmer and Scollick, of the Museum, were detailed to visit one of the stations of the Cabot Steam Whaling Company, on the coast of Newfoundland, for the purpose of obtaining a mold and skeleton of a sulphur-bottom whale. In this they were eminently successful, returning with the mold and skeleton of a seventy-eight foot specimen. From the mold a cast was made and colored, and both cast and skeleton are now suspended in one of the halls of the Museum, forming probably the largest individual biological exhibits in the institution.

Early in 1904, Palmer accompanied Dr. George P. Merrill, of the geological department of the Museum, to the State of Sinaloa, Mexico, with the object of making a mold of the great Bacubarito meteorite, a cast of which was later placed on exhibition in Washington. A year later, he was assisting in the installation of various Museum exhibits at the Lewis and Clark Exposition, at Portland, Oregon, and while in the West visited Mount Shasta, California,

Victoria, B. C., and other localities, for the purpose of adding to his zoological and botanical collections.

In the spring of 1908, Dr. F. W. True visited the Calvert Cliffs in Maryland, and obtained "a nearly complete skeleton of a fossil porpoise, discovered by Mr. William Palmer," which later became the type of *Delphinodon dividum* True. It was probably about this time that Palmer began to take an interest, which later became all absorbing, in the fossils, particularly the remains of cetaceans, of this famous locality. In the latter part of the year 1908, he was detailed to make collections here, and in later years undertook various other official collecting trips to the same region, obtaining much important material, particularly among cetaceans, from teeth, jaws, and other fragments, to nearly complete skeletons.

In January, 1909, Palmer started with Mr. Owen Bryant on an expedition to Java, and was absent from Washington for more than a year and a half, making large collections in the western end of that Island, at various localities in the residencies of Bantam, Batavia, and Preanger. Palmer was alone during part of the time, spending several weeks at high altitudes on the volcanoes of Gedé, Salak, and Pangerango, where he found many interesting birds, among them a robin that inhabited the craters and higher levels, which in its actions reminded him strongly of the common species of the United States. The Javan species, although discovered nearly a century before the time of Palmer's visit, was still rare in collections. On one occasion, while on the summit of Mount Salak, he carried his breakfast into the crater, boiled some eggs in one of the many hot springs, and sat down to enjoy his meal, surrounded by hundreds of steam jets, streams of hot water, and other evidences of volcanic activity. At another time he was encamped for a month or more along the coast, within sight of the island of Krakatoa whose volcano created great havoc in 1883. Possibly as a result of prolonged hard work in the hot lowlands, both travellers suffered greatly in health, and at one period Palmer passed several weeks in the hospital at Batavia, desperately ill with a bad type of malarial fever, the ravages of which were noticeable even after his return to Washington, in the summer of 1910.

The Javan expedition, undertaken at Mr. Bryant's expense, resulted in a collection of over 2,100 birds, with a large variety of miscellaneous specimens, and was divided between the National Museum and the Museum of Comparative Zoology, Cambridge, Mass.

By the time Palmer returned from Java, the natural history portions of the U. S. National Museum exhibits had been removed to the new building, and much of his time thereafter was devoted to various phases of the installation and arrangement of the zoological material, such as the formation of an exhibit of the local fauna, in which he freely drew upon his own collection for rarities, besides collecting much new and fresh material; the preparation of labels for the specimens of this exhibit; the production of certain new groups and the renovation of others, as in the Carolina Paroquet, where two groups were combined with new accessories, producing in effect, a new group. He rebuilt the flamingo group, repaired and remounted several hundred casts of American fishes, and from time to time was called upon for much special work in other directions. It may be mentioned in passing, that in the earlier years of his career, Palmer's services were many times requisitioned for the purpose of operating the lantern slide machine, in the handling of which he was an expert, in connection with illustrated scientific lectures at the Museum, the Cosmos Club, and elsewhere. He attended many technical meetings in this capacity, and was thereby enabled to absorb much information of value over a wide range of scientific topics.

When the last Passenger Pigeon died at the Cincinnati zoological gardens, on September 1, 1914, and was sent to the National Museum for preservation, Palmer had the distinction of making a specimen of this bird, an operation that was performed on the 4th, at the home of Dr. Shufeldt, who took advantage of the opportunity to study the fresh anatomy, and to make photographs of the bird at various stages of the work. Some account of this ceremony was given by Dr. Shufeldt in 'The Auk' for 1915.

Early in 1917, Palmer was detailed to visit certain cave deposits in the mountains of Pinar del Rio province, Cuba, for the purpose of securing Pleistocene mammalian remains. He obtained about

400 specimens of this class, and incidently collected a varied lot of other material.

In connection with the identification, purchase, and shipment of a rare whale skeleton, Palmer was sent to Jacksonville, Florida, on three occasions during the fiscal year 1919-1920. Early in April 1921, he accompanied the Museum mammalogist, Mr. G. S. Miller, Jr., to New York, to examine certain cetacean material at the American Museum of Natural History, in connection with an investigation in which they were jointly engaged. While attending a meeting of the Explorers' Club one evening, Palmer became ill, exhibiting symptoms probably apoplectic in origin, although the gravity of his plight was not recognized at the time. He was assisted to his hotel, but it was not until the following morning that his condition was found to be serious, when he was removed without delay to Bellevue Hospital. He died there, on the 8th of April. Funeral services were held in Washington, four days later, with interment at Rock Creek Church Cemetery.

Palmer's activity as a collector was by no means confined to official trips, for he was a diligent collector on his own account. In the spring of 1874 he began a collection of birds, and while this was at first confined to local specimens, he soon added to it material obtained on excursions made to various sections of Virginia. In time his collection became one of the notable private accumulations of Washington, and contained many local rarities and records some of which have not been duplicated. In addition to birds he was long interested in the local fauna and flora generally, especially of ferns, and contributed a long series of specimens to the collections of the National Museum during his forty-seven years connection with it. It is of record that he made the earliest discovery of several species of local plants, and among birds his finds were numerous. He obtained the first local record of Brewster's Warbler, and secured the only local specimen of Kirtland's Warbler and of the Ruff. Other record finds were Grinnell's Water Thrush, the Semipalmated Plover, and the Hawaiian Petrel, which, at that time, was also new to the American fauna. It seems only a few years ago that Palmer found a young night heron perched in a tree in the Smithsonian grounds, and deciding

that its plumage was somewhat unusual, he maneuvered until he captured the bird alive, and brought it to the Division of Birds for closer examination. It proved to be a Yellow-crowned Night Heron, the first for the local area, and still unique in this respect.

To secure specimens for his collection he made a trip to Cobb's Island, on the coast of Virginia, in the summer of 1881, and in later years made several trips to the neighboring Smith's Island, usually in company with other local ornithologists. He visited the Dismal Swamp on several occasions, and among the cane and cypress of this area he found the Florida Yellowthroat in some abundance, forming quite an extension of its former known range. A trip to the Kissimmee River region, in Florida, undertaken in February and March, 1895, in company with Messrs. Ridgway and Brown, was one of his more pretentious personal collecting ventures, and furnished him with both experience and specimens that were new. He published an account of some of the birds observed on this trip, in the 'Osprey,' in 1901, and also wrote a paper on the Florida Burrowing Owl, which appeared in 'The Auk' in 1896, in which he made some original and interesting observations on the habits of these birds.

Palmer did not hoard rarities in his personal collection, but generously distributed them elsewhere, for his chief interest lay in a study of the molt of birds, and he was for a long time a close student of plumage changes, his collection being well filled with juvenile plumages and with specimens in various stages of molt. At all times his collecting was done with a motive. He did not collect simply to amass material, but while his keen eye sought out rarities and records, his attention was focused primarily on examples that would furnish explanations in the phenomena of bird molt or such other subjects as engaged his attention at the time.

As far back as 1896, he wrote "If collectors would save their worn and molting specimens instead of throwing them away as 'worthless,' changes of plumage would be far better known." Although he studied this subject for many years, he wrote little, except in the case of a few species, where he thought he had accumulated sufficient data to warrant placing it on record. His

general tendency was to hold up a manuscript, or delay its preparation, until he had exhausted the subject, with the result that he left many pieces of work unfinished, through failure to find an explanation for each discovery connected with them. On the other hand, some of his published papers contain statements that seem largely tinctured with theory, but as he was a keen and patient observer it is quite possible some of these statements were based upon actual observation.

He had an analytical mind, and usually arrived at his results by an original course of reasoning that was entirely unbiased by the opinions of others. As an illustration of his procedure, the following may be cited from his study of the Maryland Yellow-throat group. He found, for example, that in birds from one section of Virginia the yellow of the throat extended down on the breast, terminating in a point, whereas, in those from another locality, the yellow was worn off evenly across the breast. In explanation of this, he wrote that birds of the first locality perched "on the long inclining leaves of wire-grass abundant in the marsh, bushes and twigs being uncommon. Alternate contact of the sides of the body with the grass wears the yellow tips of the feathers, leaving the center of the body almost untouched," while in the second instance the birds perched on "generally horizontal twigs" which produced a wearing of the feathers evenly across the breast. He was thus not satisfied simply to announce the character of differences observed, but sought to interpret the causes of them. Indeed, probably his most serious fault, if fault it be, was this effort to produce an explanation for each fact or discovery announced. It is certain that some of his papers were prepared only after long deliberation and with much care, and a reviewer of his contribution to the 'Avifauna of the Pribilof Islands' referred to it as a "model of painstaking work," which, indeed, it is. In this paper he added twenty-three species to those previously known to inhabit the Islands; discriminated the Ruddy Turnstone of eastern North America as distinct from the European bird, a change now generally adopted; separated an Alaskan form of the Barn Swallow, which Dr. Joseph Grinnell later named in his honor; went into much detail concerning the structure of

downy feathers and in the succession of plumages in cormorants, and introduced a new term, "mesoptile" for a type of feather between the down and the adult feather. He advanced ingenious theories as to the origin, distribution, and migration of Pribilof and other Arctic birds, and supplied much original matter on the habits and status of the various species treated, producing a most creditable work. His investigations on shrikes, embodied in a paper "Our Small Eastern Shrikes," in which the now well known Migrant Shrike was first recognized, was another subject to which Palmer devoted much time before reaching the stage of publication. His facilities for research work, limited as they were by the nature of his official duties, did not readily permit his taking up subjects beyond those that came within his own field experiences.

In addition to his contributions to ornithology Palmer wrote a number of papers on botanical subjects, more particularly on ferns, a group in which he had been an interested student for many years. His fern collection was begun in the winter of 1873–'74, with the definite object of obtaining a good series of normal examples as well as variations, but the discovery of a new species was apparently of little interest to him. Birds and ferns were the only groups in which he had accumulated material for his private collections, except fossils, in recent years, and by the terms of his will, made in the year 1900, these two collections are bequeathed to the U. S. National Museum, with the proviso that 500 skins of birds are to go to the University of Virginia.

Although Palmer found time to contribute about sixty papers and lesser items to the scientific journals, it was as a field naturalist that he reached his greatest development, for his experience in the local region extended over nearly fifty years, and with an excellent memory for past events, he was able to recall natural history conditions as they existed here long ago. He did not give up field work with advancing years, but continued his trips with undiminished interest. He was a congenial and wholesome companion on trips afield, and frequently accompanied the younger naturalists on their excursions to neighboring parts of Virginia and Maryland. His adventures on these collecting trips were many and varied, especially while searching for fossils at low tide along the

base of crumbling cliffs, and it is not surprising that some one incident or experience should stand out with greater prominence than others. Palmer met with such an experience in 1917, when on one of his excursions to Plum Point, near Chesapeake Beach. On his way to the cliffs, he stopped as usual at the home of the Dixon family, friends with whom he put up when his work required an extended stay, and on leaving for the fossil site was followed by "Doll," the pet dog of the house, who frequently accompanied him on these trips. During the course of his work he accidentally dislodged a large mass of earth, which fell on him with crushing force pinning him on his back to the ground. Although severely injured, he succeeded in freeing his arms, and gave his attention to considering means for relief. Travel is infrequent at this point, and the imprisoned man decided that in his four-footed friend lay his only hope of an early rescue. Managing to find pencil and paper in his pockets, he scribbled a brief message explaining his predicament, and calling the dog fastened the message securely to her neck with his neck-tie, and attempted to drive her home. But "Doll" was inclined to regard this as a new play, not understanding what was expected of her. Finally, after clods of earth had been thrown at her, the animal left. Fortunately, she went directly home, but had some difficulty in gaining admittance, in spite of her barking, as Mr. Palmer was supposed to be near at hand. However, she finally succeeded, and Mrs. Dixon quickly discovered the unusual decoration. A closer inspection disclosed the message, other members of the household were notified, and a relief party was shortly on the way to the cliffs, a half mile or more distant, where the injured man was found and soon extricated from his unusual plight. He was unable to stand, and was carried back to the house, and later removed to his home. It was several weeks before he was able to return to his duties at the Museum, and for a long time thereafter he walked with a limp; in fact, is said never to have fully recovered from the effects of this experience.

Mr. Palmer was a member of several societies. Years ago he belonged to the Society of American Taxidermists, which, at its third annual exhibition, held in New York City, in May, 1883,

awarded him a special medal for a cast of a leather-backed turtle's head and a certificate of merit for mounted birds. In 1888 he was elected a member of the American Ornithologists' Union and became a Fellow ten years later. He was a member of the American Association for the Advancement of Science, of the American Fern Society, its president ("by a nearly unanimous vote") in 1917–1918; an original member of the Washington Biologists' Field Club, and its president in 1913–1914. He was a member of the Biological Society of Washington, and a member of its council in recent years. At its meetings he read various papers, and exhibited specimens, principally of the local fauna and flora, but in later years notes on fossils largely crowded out other subjects. Two younger associations, the American Society of Mammalogists, and the American Society of Ichthyologists and Herpetologists, also claimed him as a member.

Thirty years ago an organization called the Potomac Valley Ornithological Club was launched in Washington, and numbered among its members most of the active local field ornithologists and bird lovers of that time. It held 62 bi-weekly meetings (except in the summer months), from February 1892 to April 1896. William Palmer was elected its president at the outset, and was annually reelected to the same office, almost without opposition, until the Club ceased to exist. He was a faithful attendant at meetings, and read a number of papers, among them one on the presence of wing-claws in birds; another on the "Malar stripe of the young Flicker," the substance of which was later published in 'The Osprey,' in 1901. At the meeting of December 10, 1894, he read a paper on "The Immature Bird's Skull," illustrated with specimens and drawings, in which he demonstrated a method of determining the age of birds by reference to the top of the skull, which, in young birds, shows a certain area of translucent unossified structure, a fact little known at that time, although now quite commonly used by collectors as a test in determining the age of individual specimens. The Potomac Valley Club did not issue any published record of its proceedings, and the data given above has been gathered from the minute-book of the Club, which is still extant.

Palmer was a man of powerful physique, particularly in his younger days, and was wont to indulge in long and difficult pedestrian feats with little show of fatigue. He was a loyal, good hearted and steadfast friend, though undemonstrative, and inclined to be stoical by nature. He accepted good or bad news as it came to him, without display of emotion, but there were times when he waxed enthusiastic and became animated over the discovery of a rare specimen in the field, or when discussing some problem on which he had fortified himself by careful investigation. He was a man of firm convictions and tenacious of his opinions, always ready to argue the point on any subject upon which he held decided views, and was even dominating and aggressive when on familiar ground.

Mr. Palmer's published contributions are somewhat scattered, and several of his earliest notes were printed in the 'Pastime,' a small and all but forgotten monthly periodical with natural history leanings, of which he was for a time one of the editors and proprietors. As some of the titles are now difficult of access, it has been thought best to give a full list of his publications.

LIST OF THE SCIENTIFIC PUBLICATIONS OF WILLIAM PALMER.

Avifauna Columbiana.
'Pastime,' III, No. 1, July, 1884, pp. 5, 6.

Avifauna Columbiana.
'Pastime,' III, No. 2, August, 1884, pp. 13, 14.

[A porpoise, *Tursiops tursio*, in the Potomac.] (Anonymous.)
'Pastime,' III, No. 2, August, 1884, p. 16.

[A cormorant on the Potomac, off White House Point.] (Anonymous.)
'Pastime,' III, No. 2, August, 1884, p. 16.

[Albino young robins.] (Anonymous.)
'Pastime,' III, No. 2, August, 1884, p. 16.

A Botanical Trip up the Anacostia. "By one of the Party."
'Pastime,' III, No. 4, October, 1884, pp. 25, 26.

The Ferns of Washington and Vicinity. (Anonymous.)
'Pastime,' III, No. 4, October, 1884, pp. 29, 30.

Arrival of Spring Birds.
'Pastime,' III, No. 4, October, 1884, p. 30.

[A shearwater on the Potomac.] (Anonymous.)
'Pastime,' III, No. 8, February, 1885, p. 8.

[The Prairie horned lark in Alexandria Co., Va.] (Anonymous).
'Pastime,' III, No. 8, February, 1885, p. 11.

Abundance of Parus atricapilius near Washington.
'Auk,' II, No. 3, July, 1885, p. 304.

Occurrence of Helminthophila leucobronchialis in Virginia.
'Auk,' II, No. 3, July, 1885, p. 304.

Additions to the Avifauna of Washington and Vicinity. By Hugh M. Smith and William Palmer.
'Auk,' V, No. 2, April, 1888, pp. 147, 148.

Occurrence of Traill's Flycatcher near Washington, D. C.
'Auk,' VI, No. 1, January, 1889, p. 71.

First occurrence of the Philadelphia Vireo near Washington, D. C.
'Auk,' VI, No. 1, January, 1889, p. 74.

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'Proc. U. S. Nat. Mus.,' XIII, No. 819, October 14, 1890, pp. 249–265.

Fate of the Fur Seal in America.
'Forest and Stream,' XXXVII, No. 15, October 29, 1891, pp. 287–288.

Do Wading Birds Swim?
'Nidiologist,' I, No. 12, August, 1894, p. 175.

Plumages of the Young Hooded Warbler.
'Auk,' XI, No. 4, October, 1894, pp. 282–291, figs. 1–4.

The Ruff and Western Sandpiper near Washington, D. C.
'Auk,' XI, No. 4, October, 1894, p. 325.

An Asiatic Cuckoo on the Pribylof Islands, Alaska.
'Auk,' XI, No. 4, October, 1894, p. 325.

Four Additions to the Birds of the Virginias.
'Auk,' XI, No. 4, October, 1894, pp. 333, 334.

[Notes on the Pacific Walrus and its skin.]
Report of U. S. Nat. Mus. for 1893, 1895, pp. 50–52.

Photographs of Young Skimmers, by R. W. Shufeldt, With Notes on the Breeding Habits of these Birds by Mr. Wm. Palmer.
'Nidiologist,' III, No. 3, November, 1895, pp. 26–28, 2 figs.

The Scissor-tailed Flycatcher in Virginia and Maryland.
'Auk,' XIII, No. 1, January, 1896, p. 83.

Second occurrence of the Lark Sparrow in Virginia.
'Auk,' XIII, No. 1, January, 1896, p. 84.

On the Florida Ground Owl (*Speotyto floridana*).
'Auk,' XIII, No. 2, April, 1896, pp. 99–108, pl. II, 2 text figs.

Thoughts on the New Check-List.
'Nidologist,' III, No. 8, April, 1896, p. 91; No. 9, May, 1896, pp. 102, 103.

Stone on the Molting of Birds. (Review.)
'Auk,' XIII, No. 3, July, 1896, pp. 240–243.

The Check-List again.—A Rejoinder.
'Nidologist,' III, No. 12, August, 1896, pp. 138, 139.

Chimney Swift Feeding its Young.
'Nidologist,' IV, No. 2, October, 1896, p. 17.
A Note on Buteo borealis lucasanus Ridgway.
'Auk,' XIII, No. 4, October, 1896, p. 342.
Breeding of the Yellow-throated Warbler (*Dendroica dominica*) in Virginia, near Washington.
'Auk,' XIII, No. 4, October, 1896, p. 343.
The Wood Ibis in Virginia and Maryland.
'Auk,' XIV, No. 2, April, 1897, p. 208, 209.
An Addition to North American Petrels.
'Auk,' XIV, No. 3, July, 1897, pp. 297–299.
Bachman's Sparrow in Virginia.
'Auk,' XIV, No. 3, July, 1897, p. 322.
The Sitkan Kinglet.
'Auk,' XIV, No. 4, October, 1897, pp. 399–401.
The Tree Swallow Breeding in Virginia.
'Auk,' XIV, No. 4, October, 1897, p. 408.
Our Small Eastern Shrikes.
'Auk,' XV, No. 3, July, 1898, pp. 244–258.
The Ferns of Hemlock Bluff.
'Plant World,' II, No. 9, June, 1899, pp. 143–147.
A new locality for Asplenium pinnatifidum.
'Fern Bulletin,' VII, No. 3, July, 1899, pp. 70, 71.
Ferns of the Dismal Swamp, Virginia.
'Proc. Biol. Soc. Washington,' XIII, September 28, 1899, pp. 61–70.
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'Auk,' XVII, No. 3, July, 1900, pp. 216–242.
False Trinomialism.
'Fern Bulletin,' IX, No. 1, January, 1901, pp. 13–15.
A Rich Locality.
'Fern Bulletin,' IX, No. 1, January, 1901, p. 18.
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'Plant World,' IV, No. 2, February, 1901, pp. 21, 22, pl. 2.
The Scientific Name of the Southern Yellow-throat.
'Auk,' XVIII, No. 2, April, 1901, pp. 197, 198.
Warden's List of the Birds of the District of Columbia.
'Osprey,' V, No. 4, April, 1901, pp. 57, 58.
Cuban uses of the Royal Palm.
'Plant World,' IV, No. 6, June, 1901, pp. 107, 108.
The Blue-Gray Gnatcatcher.
'Osprey,' V, No. 6, June, 1901, pp. 86–88, 2 figs.

Chapman on the Meadow Larks. (Review.)
'Osprey,' V, No. 6, June, 1901, pp. 95, 96.
The Malar Stripe of Young Flickers and the Molt.
'Osprey,' V, No. 7, July, 1901, pp. 102–104, 1 fig.
Norton on Labrador Birds. (Review.)
'Osprey,' V, No. 7, July, 1901, p. 112.
Some Birds of the Kissimmee Valley, Florida.
'Osprey,' V, No. 9, September, 1901, pp. 131–133, 1 pl.; No. 10, October, 1901, pp. 147–149, 1 pl.; No. 11–12, November–December, 1901, pp. 163–165.
August Birds on Stony Man Mountain, Virginia.
'Osprey,' N. Ser., I, No. 1, January, 1902, pp. 9–12.
Macoun on Canadian Birds. (Review.)
'Osprey,' N. Ser., I, No. 1, January, 1902, p. 20.
Descriptions of Three new Birds from Cuba and the Bahamas. By Wm. Palmer and J. H. Riley.
'Proc. Biol. Soc. Washington,' XV, March 5, 1902, pp. 33, 34.
The Log Fern.
'Fern Bulletin,' X, No. 2, April, 1902, pp. 37–41.
Another use for the Royal Palm.
'Plant World,' VI, No. 3, March, 1903, pp. 55, 56.
Gyrostachys simplex in Virginia.
'Proc. Biol. Soc. Washington,' XVII, December 27, 1904, p. 165.
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'Plant World,' IX, No. 1, January, 1906, pp. 8–11.
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'Fern Bulletin,' XIV, No. 3, July, 1906, pp. 78, 79.
Instinctive Stillness in Birds.
'Auk,' XXVI, No. 1, January, 1909, pp. 23–36.
Description of a New Species of Leatherback Turtle from the Miocene of Maryland.
'Proc. U. S. Nat. Mus.,' XXXVI, No. 1669, April, 27, 1909, pp. 369–373, pl. 31.

TRAPPING DUCKS FOR BANDING PURPOSES.

WITH AN ACCOUNT OF THE RESULTS OBTAINED FROM ONE WATER-FOWL STATION.

BY FREDERICK C. LINCOLN.

Plates XI–XIV.

THE marking of migratory waterfowl presents a most interesting phase of bird banding work to those persons so fortunately located as to be able to give it a portion of their time. Among the many advantages of such operations is the relatively great importance that attaches to detailed studies of these birds, and the assurance of solution of some of the problems because of the many "returns" that the operator will be justified in expecting from his activities. True, the returns are in most cases from dead birds, in contrast to the numerous returns that may be secured from a single individual of the non-game species through the continuous operation of the regular small bird trapping station. This is, however, largely offset by the greater number of returns from the birds that are hunted for sport, which may equal fifteen to twenty-five per cent of the total number banded. And when systematic trapping has been definitely applied to these groups at a large number of stations, the returns will, of course, be even greater.

With these facts in mind, the best methods of operation become of paramount importance, and in the following pages the writer endeavors to present the methods of duck trapping that have been tried by different collaborators of the U. S. Biological Survey, with comments on their effectiveness. There is also included a resumé of the results that have been obtained through the activities of one of the most successful stations, that at Lake Scugog, Ontario, Canada.

Traps for waterfowl fall naturally into two classes—those designed for the river or surface feeding species, and those adapted to diving ducks. Each of these may in turn be divided into those

that are automatic, or which do not require the presence of the operator, and those that are under more or less continuous observation and that are manipulated from a blind.

Thus far the surface-feeding ducks have received more attention than have those that obtain their food by diving in a considerable depth of water, and in consequence virtually all of the traps described have been developed for use in catching such birds. It is of decided importance that this partiality be overcome in the near future because there is quite as much to be learned regarding the migrations and habits of the diving ducks as of the more easily trapped surface feeders.

Automatic traps.—The principle of most automatic traps is that of "confusion," effected either by obstructing "wings" or by a simple adaptation of the funnel so successfully employed in the Government sparrow trap.[1] Mr. H. S. Osler of Toronto, Ontario, has developed a large trap of this type (See Plate XI) that has given exceptionally fine results. A raft, made by bolting planks to two cedar logs forty feet long and twelve feet apart, is employed for the foundation. Upon this is placed a framework of galvanized iron pipe covered with the regular two-inch hexagonal mesh poultry wire. Entrances are left at both ends and protected by short wings that serve to deflect any captured birds that might endeavor to escape. Doors are also provided which may be closed on the approach of the operator to band his captures. A small semicircular pen on one side near the center serves to confine a few live decoys. This trap is towed into position in a natural feeding area (in Mr. Osler's case a bed of wild rice) and the raft sunk below the surface of the water by covering the floor with mud. Mr. Osler's trap secured approximately 600 ducks of four species during the autumns of 1920 and 1921.

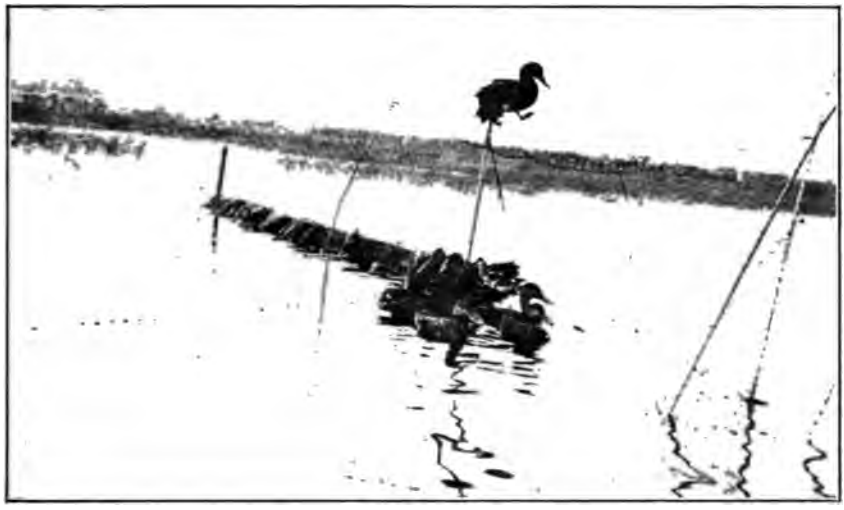
This is probably one of the best types of automatic trap on a large scale, and it will be readily apparent that the same general plan of construction may be followed for a non-automatic trap to be operated from a suitable observation point. Plate XII shows a trap of this kind that was built by the writer at Ray Lake,

[1] U. S. Department of Agriculture Circular No. 170, Contribution from the Biological Survey, *Instructions for Bird Banding*, by Frederick C. Lincoln.

near Oakville, Iowa. The trap chamber, measuring twenty feet long, eight feet high and six feet wide, was placed on the shore of the lake in an area where large numbers of Mallards had been fed by an active conservationist, Mr. Allen Green. Half of the front was converted into a door hinged at the top with wire loops, and swinging outwardly. This was supported in an open position by a strong cord that ran over the top of the chamber to the veranda of a cottage seventy-five yards away. A forked stick, lashed horizontally to one wall near the bottom, served as a catch to lock the door after it had been released. In the rear of the chamber a piece of netting extending between the walls formed a pen that confined the decoys. The lake at this time was frozen over, but had open water been available the effectiveness of the trap would have been greatly increased by providing wire netting wings, extending from the entrance in a widely diverging angle. These would have been carried as far as possible into the water and should have had the effect of forcing swimming birds in the direction of the door. Small funnel-like openings back of the wings at their junction with the trap chamber would permit the entrance of those birds that might work toward the trap from behind the wings. These directing wings may be used to advantage with almost every kind of trap.

A large automatic trap of the funnel type that was designed by the writer is shown on Plate XIII, fig. 1. This trap gave exceptionally fine results during recent (March, 1922) work in the Illinios River marshes. As used there, it was built in about two feet of water and consisted of a pen made by covering a framework of willow saplings with ordinary two-inch poultry wire, the bottom being secured by burying the netting deep in the mud with a number of forked stakes. The shape of the chamber was that of a deeply indented heart or water-lily leaf, the funnel forming the indentation, thus leaving large "pockets" on either side. Captured ducks will gather in these pockets and avoid the opening of the funnel which was almost or quite in the center of the chamber. Instead of "wings," a single "lead" or fence of wire netting was extended straight out from the exterior opening of the funnel for a distance of fifty or sixty feet. This was used because of the fact





PHOTOS BY H. S. OSLER.

1. LARGE AUTOMATIC TRAP, LAKE SCUGOG, ONTARIO.
2. REMOVING A DUCK FROM AUTOMATIC TRAP.

that the trap was set in the midst of a natural feeding area and not on a shore line.

Two of these traps caught a large number of birds, the record catch being shown in the illustration which amounted to practically one hundred Mallards, Pintails and Black Ducks. Considerable success was also obtained in this region by grouping several of the common "fyke" nets in shallow water and baiting the area with shelled corn. These nets, however, have a serious disadvantage in that the chambers are small and there is danger that so many birds may work into the second chamber as to force some under water and drown them. Plate XIII, fig. 2 shows a catch of Mallards and Pintails on one of these nets. Three nets were used in making the "set."

Another trap of the automatic variety has been developed by the writer for use where local conditions, such as a marsh of cattails or reeds, demand one of smaller size. They may, in fact, be termed portable traps, as distinguished from those that when once built are more or less permanent. A box or chamber measuring five feet long by two feet square is built from two-foot poultry wire. No corner posts are used, the stiffness of the netting giving ample strength, and the slight visibility that results from the absence of heavy supports is a feature highly desirable. Three pieces of netting are used, two sections five feet long for the top and bottom, and a third, about sixteen feet long, for the sides, back, and funnel. The funnel is formed by carrying the ends into the chamber in front, fastening them together for about half their width and spreading them apart at the bottom with a piece of heavy wire bent to form an inverted "U." All connections or joints are secured with wire by a pair of pliers. The jagged ends of the netting are left projecting into the chamber, which arrangement will effectually prevent captured birds from making their exit. Such traps are very light, and their simple construction and ready portability will permit their use in a wide variety of situations.

Non-automatic traps.—Where the ducks may be baited to the shore, a trap that throws a net is most satisfactory. One of this kind has been successfully used by Mr. Joseph Pulitzer, Jr., of

St. Louis, Missouri, at the Cuivre Island Club, Missouri, and at Bar Harbor, Maine. This is another of the non-automatic types, the principle involved being a development of the old spring-pole trap that was used so effectively in trapping Passenger Pigeons for the market. Two straight saplings, about forty feet long and five or six inches in diameter across the butt, are set firmly into the ground about seventy-five feet apart, at right angles to and back from the shore line. The tips should be elevated five or six feet, and the position of the poles maintained by forked posts set rigidly into the ground about mid-way of their length. The tips are connected by a piece of heavy wire (about number 8 or 10), and to this the net is attached. For a trap of the size described, the net should be about twenty feet square, although a larger net might be thrown to advantage by increasing the size of the spring poles. Two triggers or releases are provided which should be located about twenty-two feet apart in the area between the poles and about the same distance back of the normal position of the net wire. Plate XIV, fig. 2 shows the construction of these releases. Broom handles make excellent trigger poles, which are notched an inch or two from one end to hold the net wire. The supporting cleats, pull wire (lower center), net pile, and a portion of the baited area are also visible in this picture. The trap is set by pulling the net wire back to the trigger, where it is held in place by the notches in the trigger poles, the upper ends of which slip under the projecting cleats. This operation serves to bend the spring poles sharply inward and when fully set the net wire should form a straight line between the triggers with the net piled up smoothly behind it. The opposite end of the net is, of course, secured to the ground by stakes. A wire running from one of the trigger poles to a convenient blind, is pulled to release the trap. This will cause a simultaneous movement of the opposite pole, which, no longer held in place by the cleats, rises vertically, the throw wire slips off and flies forward, pulling the net with it. With powerful poles this action is extremely rapid and there is no time for a duck to escape. Plate XIV, fig. 1 shows the trap set at Cuivre Island, in which the bent spring poles, triggers, and

line of bait in front of the net are clearly visible. The live decoys used may also be observed at the shore line below the bait.

As stated previously, the trapping of diving ducks presents greater difficulties than of those species that feed on the shore or in comparatively shallow water. It should be remembered, however, that diving ducks usually dive when alarmed, and it is therefore doubtful whether an automatic trap would be advisable, as they might kill themselves if allowed to remain prisoners for any length of time. This is a matter that actual experiment must determine, for it is obvious that an automatic trap, if practical, will yield much greater results.

At the present time the most satisfactory trap for these birds is the one used by Dr. A. A. Allen of Cornell University, on Cayuga Lake, New York. In a natural feeding ground a three-sided pen is built of galvanized poultry wire. Iron pipes make the best corner posts; and care must be taken that the netting fits snugly to the bottom. About two feet of water will be a sufficient depth, and the netting should project a corresponding distance above the surface. No top is necessary because of the fact that diving ducks can not leave the water as readily as Mallards, Pintails, and other river ducks, but, instead, require a long start across the surface. As these birds will hesitate to swim under anything, this absence of a top has a decided advantage; and for the same reason the trap door that closes the fourth side should lie flat on the bottom when the pen is open. This door is best made by covering a frame of small gas pipe with the wire netting. A cord or wire, run to a suitable observation point, is used to raise the door and close the trap.

The matter of bait must always be given careful attention. At times, particularly during the summer, duck trapping may become the most disheartening kind of work, because of the actual indifference of the birds to cereal baits at a time when natural food is probably abundant. Generally speaking, corn (preferably cracked) will be found to be the best bait, but various small grains such as rice, wheat, kaffir corn, and barley may at times be used to advantage. Decoys are always advisable, since, as it usually takes from a few days to two weeks for wild ducks to

become sufficiently accustomed to the presence of the superstructure of the trap to venture near the bait, a few live decoys may prove of the greatest value in gaining their confidence.

Results at Lake Scugog, Ontario.—Turning now to the relative importance of the systematic banding of waterfowl, a considerable amount of valuable data will be found in the results of the operations of Mr. H. S. Osler of Toronto, Ontario, in 1920.

Lake Scugog, where the trapping has been done, is a small body of water lying about sixteen miles due north of Lake Ontario, and separated from it by a continuous ridge, which reaches its crest four miles south of the former lake. This ridge attains a height of 800 feet above Lake Ontario but only 300 feet above the surface of Lake Scugog. With its surrounding marshes of wild rice and other aquatic plants, the lake seems to offer excellent opportunities for ducks to feed and rest before starting on the long flight to the south. It is also utilized to some extent as a breeding ground.

According to the observations of Mr. Osler, the great body of ducks moves southward at one time, generally about the middle of November, and coincident with the first heavy wind from the north or northwest. Prior to this major flight, scattering small flocks and isolated pairs drift southward in short flights. This is also attended by continuous influxes of migrants from the great inland breeding areas, each northerly wind bringing down its quota. These observations, based on several years experience in the Scugog marshes, have been fully verified by the "return" records of the banded birds.

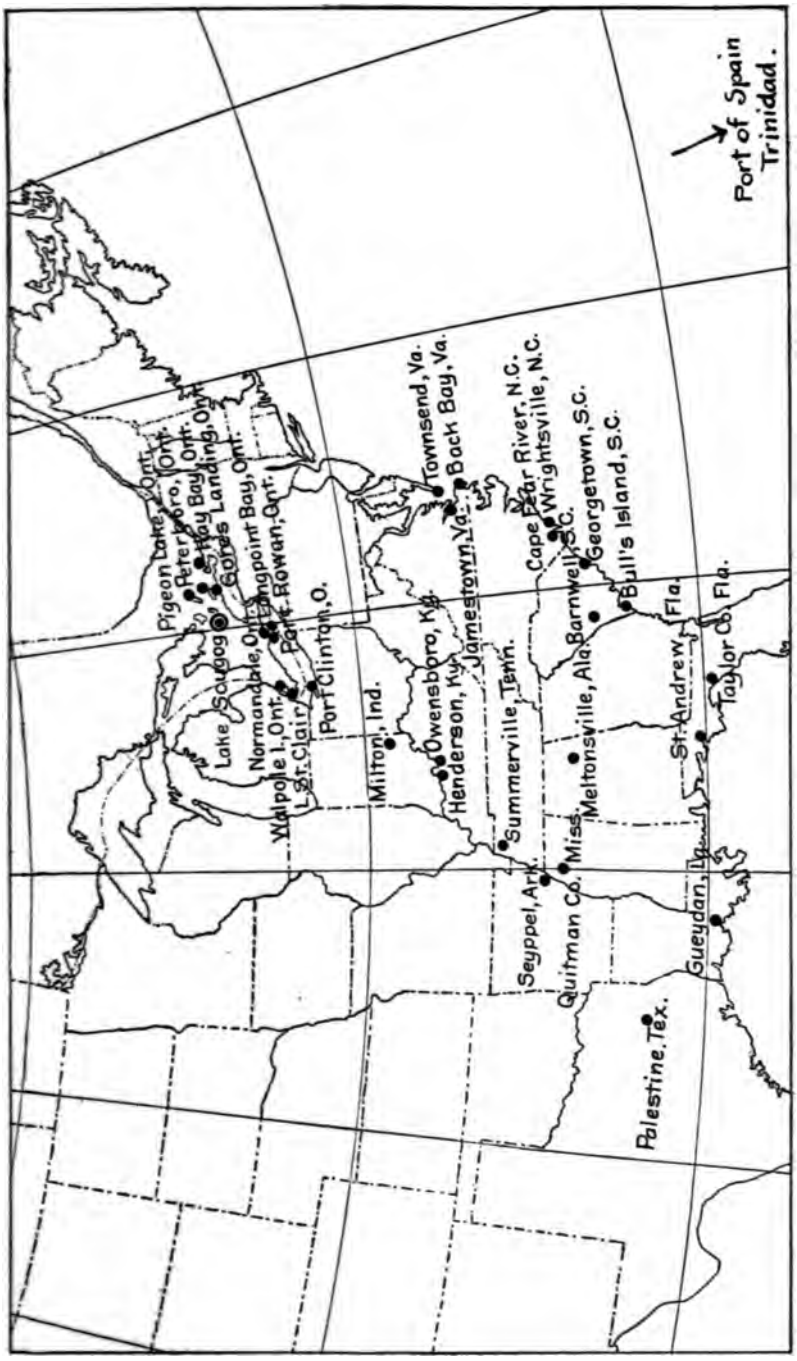
Trapping operations were begun about September 1, 1920. At this time the weather conditions were fair with moderate winds from southwest to north and the ducks then present (principally Mallards and Black Ducks) represented the local breeders with their progeny, with probably the van of those from the interior. The great bulk of the more northern-bred ducks arrived in September and October during a continued spell of mild weather, which afforded them an excellent opportunity to rest and feed in the Scugog and adjacent marsh lands. During these two months the trap was in full operation, the catch being 206 ducks of four





PHOTOS FROM BIOLOGICAL SURVEY.

1. LARGE NON-AUTOMATIC TRAP WITH DOOR OPEN.
2. LARGE NON-AUTOMATIC TRAP WITH DOOR CLOSED.


Port of Spain
Trinidad.
Pigeon Lake, Ont.
Peterboro, Ont.
Bay, Ont.
Gores Landing, Ont.
Lake Scugog
Point Bay, Ont.
Normandale, Ont.
Walpole I.
L. St. Clair
Port Rowan, Ont.
Port Clinton, O.
Milton, Ind.
Owensboro, Ky.
Henderson, Ky.
Jamestown, Va.
Townsend, Va.
Back Bay, Va.
Cape Fear River, N.C.
Wrightsville, N.C.
Georgetown, S.C.
Bull's Island, S.C.
Barnwell, S.C.
Summerville, Tenn.
Meltonsville, Ala.
St. Andrew, Fla.
Taylor Co. Fla.
Seyppel, Ark.
Quitman Co. Miss.
Palestine, Tex.
Gueydan, La.

species, together with Rails, Florida Gallinules, Kingfishers, Red-winged Blackbirds and one Pigeon Hawk. Practically all the ducks captured were either Black Ducks or Mallards, the majority being of the former species. Several Blue-winged Teals and two Ring-necked Ducks made up the total. The freezing of the marshes stopped trapping operations about November 19, or shortly after the larger flocks had left for their winter feeding grounds.

The shooting season in Ontario opens at the same time that the trapping was started, that is, on September 1, so it was inevitable that several of the banded birds should be killed close to the locality where they were marked. Mr. Osler reports that he had rumors of four or five thus killed, the band numbers of which he was unable to learn.

But when the big flight began about the middle of November, the shooting season was also open in every State from the Great Lakes to the Gulf of Mexico, so that the migrating birds had to run a veritable gauntlet of sportsmen, from whom the return records have been received. In considering these data it seems well to discuss the Mallards and Black Ducks together, since they seemingly followed the same route and in all probability moved in the same flocks.

The first band reported to the U. S. Biological Survey was from a Black Duck killed on October 30, at Pigeon Lake, Ontario, a few miles north of Lake Scugog. This, being a "short return," is of scant importance other than to indicate that the birds were still more or less stationary on that date. However, three days later, or on November 2, the next band, also from a Black Duck, was reported from Hay Bay, Ontario, a few miles to the south; and following this with gratifying regularity came the reports that traced the progress of the flocks in their journey to the winter feeding areas on the Gulf and South Atlantic coasts.

The course of all these migrating birds was apparently southwestward along the shores of Lake Erie by way of the St. Clair flats. Reaching the southern extremity of that lake, the route divided. The great majority continued the southwesterly course, cross-country to the Ohio River, which, flowing in the same general

direction, served as a highway to the Mississippi Valley. The second group of birds, which had separated from the main body in the vicinity of the southern shores of Lake Erie, shifted their direction of flight to the southeast, crossed the Alleghenies and reached the Atlantic coast by way of Chesapeake Bay. A study of the accompanying map will illustrate more graphically the routes taken by these two groups.

In discussing the data from these ducks, it becomes necessary to recognize a third group, which for some reason did not leave the region where they were banded until a much later period. This group was unquestionably small and there is, of course, the possibility that it was composed more or less of crippled birds or those that for some other physical reason were unable to make the flight to the south. It is, however, of some significance that Mallard No. 5104, banded on November 6, was killed on Long Point Bay, Ontario, on November 15, and that No. 5101, banded at the same time, was killed at the same place by the same hunter, on December 6. The season in Ontario closes on December 14, and no later records were secured, but in view of this single bit of information, it seems not improbable that a certain percentage of the birds at Lake Scugog in the fall were still in the contiguous country at the close of the year.

In studying the distribution of these "returns" it is worthy of note that with one exception (Meltonsville, Alabama) all the ducks were killed either along the Mississippi Valley or the Atlantic coast. It is also interesting to observe that, although both the Mallard and the Black Duck are common along the coasts of New Jersey, New York, and New England, only one of the Scugog birds was taken there, indicating that most of the ducks of these species that frequent the coasts and marshes in those sections, either breed in the region or come from northern territory nearer the coast. Southward from Back Bay, Virginia, banded ducks were reported in a fairly well-connected chain along the coasts of Virginia and North and South Carolina to Florida, where the records joined those made along the Mississippi Valley highway. Most of the Atlantic coast records are for December, January, and

February, at which time the birds were probably on their preferred winter feeding grounds.

Ducks of species other than the Mallard and Black Duck that were banded by Mr. Osler were considered too few to be of any material consequence, so it was a matter of surprise when return records for both of the Ring-necked Ducks were received. Both were killed on the Atlantic coast, one at Back Bay, Virginia, and the other in Georgetown County, South Carolina. In view of the fact that this species is not common on the Atlantic coast but is much more numerous during migrations in the Mississippi Valley, the presence on the Atlantic coast of the only two banded at Lake Scugog is of decided interest. They had probably reached the coast by the same route used by the Mallards and Black Ducks, if not actually with them.

Probably the greatest interest that attaches to any one of Mr. Osler's ducks is that of Blue-winged Teal No. 4576. This little duck was banded on September 24, in company with another of its own kind and eight or ten Black Ducks. Two months and seven days later it was killed by a hunter in the Caroni Swamp, near Port of Spain, Island of Trinidad. The flight made by this bird must have been close to 3,000 miles. For many years it has been known that some of the Blue-winged Teals and certain other ducks that breed in North America winter in South America. The presence of this species on the Island of Trinidad has been particularly noted, but there has been no information available to show from what part of the northern continent the birds came. The record of this individual is therefore of decided interest and value. The band was returned to the U. S. Biological Survey by the American Consul through the State Department.

To the conservationist the case of the Scugog ducks will afford interesting data on the mortality sustained by a given number of birds in one shooting season, which are of peculiar significance in view of the figures recently published of the number of ducks killed in one State during the open season. In 1920, Mr. Osler banded about 225 ducks of four species, all more or less sought by sportsmen, and three of the four particularly prized as table birds in almost every section of the country. During the few





PHOTOS FROM BIOLOGICAL SURVEY.

1. AUTOMATIC PEN TRAP, WATER-LILY LEAF SHAPE.
2. 'FYKE' NET USED AS A DUCK TRAP.

BOTH ON THE ILLINOIS RIVER MARSHES.





PHOTOS FROM BIOLOGICAL SURVEY.

1. LARGE SPRING TRAP (CUIVRE ISLAND, MISSOURI), FRONT VIEW.

2. DETAILS OF ONE OF THE TRIGGER RELEASES, SAME TRAP.

months of the open season of 1920–1921, at least thirty-five of these, or about sixteen per cent were killed. (These include those reported by Mr. Osler as killed at Lake Scugog, but of which the complete data were not secured.) If these figures or the figures that will later be secured through the comprehensive work now being developed by the U. S. Biological Survey may be considered as average, then an accurate computation of the number of ducks killed during any one shooting season may provide a satisfactory index to the total number of such birds in the country at that period. The great possibilities of the work should be readily apparent.

The following table contains the data for all "returns" of 1920 Lake Scugog ducks that were reported up to March 1, 1921.

Anas rubripes and Anas platyrhynchos

Number.	Date Banded.	Date Recovered.	Locality where Recovered.
4506	Sept. 3, 1920	Sept. 6, 1920	Lake Scugog, Ont.
4656	Oct. 1, 1920	Oct. 23, 1920	Lake Scugog, Ont.
4674	Sept. 18, 1920	Oct. 30, 1920	Peterboro, Ont.
4525	Sept. 14, 1920	Nov. 2, 1920	Hay Bay, Ont.
4610	Sept. 26, 1920	Nov. 4, 1920	Caesarea, Ont. } Lake Scugog
4697	Oct. 23, 1920	Nov. 7, 1920	Caesarea, Ont. }
4668	Sept. 19, 1920	Nov. 12, 1920	Lake St. Clair, Ont.
4670	Sept. 18, 1920	Nov. 15, 1920	Rice Lake, Ont.
5104	Nov. 6, 1920	Nov. 15, 1920	Port Rowan, Ont.
4519	Sept. 9, 1920	Nov. 16, 1920	Normandale, Ont.
4518	Sept. 9, 1920	Nov. 16, 1920	Port Clinton, Ohio
4698	Oct. 23, 1920	Nov. 18, 1920	Lake Scugog, Ont.
4602	Sept. 25, 1920	Nov. 18, 1920	Cape Fear River, N. C.
4581	Sept. 24, 1920	Nov. 19, 1920	Milton, Ind.
4612	Sept. 26, 1920	Nov. 19, 1920	Henderson, Ky.
4630	Sept. 20, 1920	Nov. 20, 1920	Walpole Island, Ont.
4688	Oct. 4, 1920	Nov. 23, 1920	Seyppel, Ark.
4611	Sept. 26, 1920	Nov. 23, 1920	Summerville, Tenn.
4597	Sept. 25, 1920	Nov. 26, 1920	Palestine, Texas
4640	Sept. 30, 1920	Nov. 27, 1920	Wrightsville Beach, N. C.
4592	Sept. 24, 1920	Nov. 29, 1920	Taylor County, Fla.
4616	Sept. 27, 1920	Dec. 4, 1920	Quitman County, Miss.
5101	Nov. 6, 1920	Dec. 6, 1920	Long Point Bay, Lake Erie, Ont.
4524	Sept. 14, 1920	Dec. 7, 1920	Gueydan, La.

Number	Date Banded	Date Recovered	Locality where Recovered
36986	Sept. 10, 1918	Dec. 22, 1920	Townsend, Va.
4549	Sept. 15, 1920	Dec. 28, 1920	Owensboro, Ky.
4543	Sept. 15, 1920	Jan. 1, 1921	Jamestown, Va.
4570	Sept. 18, 1920	Jan. 13, 1921	Georgetown, S. C.
5103	Nov. 6, 1920	Jan. 15, 1921	St. Andrew, Fla.
4568	Sept. 18, 1920	Jan. 29, 1921	Bull's Island, S. C.
4598	Sept. 25, 1920	Feb. 5, 1921	Meltonsville, Ala.
4637	Sept. 29, 1920	Feb. 20, 1921	Barnwell, S. C.
		Marila collaris	
4700	Oct. 29, 1920	Nov. 23, 1920	Back Bay, Va.
37304	Sept. 24, 1920	Jan. 5, 1921	Georgetown County, S. C.
		Querquedula discors	
4576	Sept. 24, 1920	Dec. 9, 1920	Port of Spain, Trinidad, B. W. I.

U. S. Biological Survey, Washington, D. C.

BIRD-BANDING AT THOMASVILLE, GEORGIA, IN 1922.

BY L. R. TALBOT.

Plates XV—XVII.

THIS story tells of the bird-banding experiences of a novice. That is, I was a novice when they began on the twelfth of March, although a month later, in view of the number of birds handled, I felt like a veteran. And in that one fact lies the point that I wish to emphasize at the outset: that one does not need to be an expert in bird-banding, or a professional ornithologist, in order to take up this new and fascinating and most important phase of bird-study. Anyone with a minimum of time and a love of birds can by this means add to his own enjoyment and knowledge, and can help the cause of scientific bird-study and protection.

On March 1, 1922, bird-banding was, so far as I was concerned, largely a myth. Before the end of the month it had become, for

a while at least, the very center of my life; all my plans were conditional upon their effect on my work; a walk, a ride, a swim, a dinner engagement, all were timed so as not to interfere with the really important thing in life,—the periodical tour of the traps. I literally banded birds while I ate, as you shall see; and no one with a bit of enthusiasm in his make-up will doubt me when I say that I banded them in my sleep.

I had joined the New England Bird-Banding Association a few weeks before, and in due time had received my permits from Federal and State governments. I had pledged myself to band at least one bird this year; and I wondered whether I should be able to keep that pledge. I was frankly skeptical. I have more than kept it; in fact, I think I might ask to be retired on a pension! But I shall not; the work is too interesting for that. I shall keep it up wherever and whenever it is possible.

A bit of personal narrative is necessary that the reader may understand how a few short weeks had brought about such a change. Mr. S. Prentiss Baldwin, whose work in bird-banding is too well known to require extended comment, was unable to go to his usual trapping station in Thomasville, Georgia, this year. But to him and to others it would have seemed almost a crime if banding operations had been omitted on that plantation where so much has been accomplished. Someone must go down there and carry on. I had the good fortune to be the man. That is the whole story.

I accepted the invitation with mingled feelings. I had never banded a bird, it is true. Yet with that combination of recklessness and a sort of "the Lord will provide" feeling that animates most of us at times, I went. But I must confess that I had fears and forebodings. I feared that I might injure the birds through careless, inefficient handling. I feared that I might hurt them, or even kill them, by banding them incorrectly. I was afraid I might not be able to band them at all, that I should be helpless when I attempted to hold them, and that they would get away with nothing to show for the experience. I wondered whether I should be able to persuade the birds to go into the "gathering cage"; should I not find it necessary to open the trap and let them

go after all? These fears look ridiculous to me now, but they were genuine at the time.

Even if I should succeed in handling the birds and putting on the bands, should I not frighten them so that they would never again enter my traps, or anyone else's, for that matter? If that were the case, my results would be pretty meagre. The story of my repeats, told further on in this article, will answer this question.

And last, but perhaps most important of my forebodings, I wondered whether any birds would really go into the traps—my traps, once they were in operation. They did go in. There was no doubt about that. The traps were set up and ready for visitors at about 11 o'clock, March 12. An hour and a half later I banded six birds and took one "return," a Chipping Sparrow banded by Mr. Baldwin last year. Before night I banded nine more, making a fair total for a short first day. And they kept going in. My work at Thomasville extended over a period of thirty days. During that time I banded 313 and took 43 returns—birds banded in previous years, while the grand total of birds handled, including "repeats," or those that went back into the traps on the same or succeeding days after the original appearance, was 1804.

As to my fears. Of course I had to learn by experience and acquire a facility in handling birds. I know now that I did not handle them quite so well the first day or so as I did later. But I can honestly say that the extent of injuries due to my inexperience and awkwardness was negligible. Since "confession is good for the soul," I will explain. One Chipping Sparrow left his tail feathers in my hand when I tried to regain my hold after he had struggled and escaped. In spite of directions, I had failed to realize properly that once a bird slipped out of the hand, the operator must not try to catch him again. The incident not only taught me this, but also led me to be more careful in holding a bird in the first place. The Chipping Sparrow bore me no ill-will, however; he came back repeatedly and before I left Thomasville I had the satisfaction of seeing that his new tail feathers were almost full-grown. A Mockingbird lost a part of his tail feathers in much the same way; I felt especially sorry for him, for the tail seems





1. A CHIPPING SPARROW VERY MUCH ALIVE AND QUITE AT HOME IN THIS POSITION.
2. MOCKINGBIRD. NOTE ITS INSTINCT TO PERCH.

such an important part of a Mockingbird! But he, too, came back several times and showed me the new feathers he was growing in place of the ones lost.

Then too, during the first day or two I made several bands too tight. Birds that came back later showed evidences of my mistake. In some cases I was able to adjust the band, but generally it seemed wiser to leave it alone rather than risk breaking the leg. I am convinced that there is far more danger of a band being too tight than of its being too loose. In three cases the tarsus broke and it was necessary to amputate the foot. But, while I do not recommend having one's foot amputated as a cure for all ills, it is a fact that those three Chipping Sparrows gave every indication of being quite as well able to take care of themselves as before, and they obviously suffered no pain.

Why have I told these incidents? Would it not be better psychology to say nothing about them? For I am well aware that most, if not all bird-lovers feel an abhorrence at the thought of injuring a bird in any way. That is exactly my own feeling. And that is why I pass on these experiences, that others may profit by them, may know just where the dangers lie, and may have a more nearly perfect record than I had, perhaps 100 per cent. Do not say: "I shall not band birds if there is the remotest possibility of my injuring even one of them." Say rather: "I will band all I can, using the utmost care, and profiting by others' experience."

It should be remembered that the good results, both in scientific knowledge of ornithology and in actual protection and benefit to the birds themselves, far out-weigh the slight injuries which are possible, but not inevitable. And after all, five out of 1804 is a small proportion. And as already stated, these five were all well and contented when I left them several weeks later.

Did birds ever escape from my hand? Yes, once in a while. If for any reason I was trying to hurry, or if I became careless in holding a bird, he was likely to take advantage of the opportunity to regain his freedom. And, let me repeat, if the bird has once freed himself, the operator must not attempt to grasp him again. Yes, occasionally birds do escape, but only a very small proportion of the total number handled. Let no one worry about that.

How about driving the birds into the gathering cage? Well, that is part of the fun. It is not always easy to persuade people to do a thing of the desirability of which they have not become convinced; and sometimes a bird fails to understand why he is expected to go through a small opening which, apparently, leads nowhere and does not help matters in the least. But it is right here that different species, and even different individuals of the same species, show their "personality," if I may use that term. It is most fascinating to watch their behavior in the traps. And with patience, the operator always succeeds; there is never any occasion to give up in despair.

The birds do not become frightened. Of course they become restless when they stop eating and first discover that they are imprisoned. They wander back and forth seeking an exit, but there is no reason to believe that they really have any fear. Birds that come back every day for two or three weeks, and sometimes four or five times a day, are not badly frightened. Surely we need not worry about Chipping Sparrow No. 22824, who entered the traps six times in a single day, or No. 22735, with a record of forty-three repeats, five in a single day. One Chipping Sparrow, No. 22849, repeated fifty-four times in twenty-two days. And on several occassions I released a bird at one trap only to find him in the next one that I visited, fifteen minutes later. No bird that is frightened will lie flat on his back on the operator's wide-open hand, absolutely free to fly away, but evidently perfectly contented. This was not an occasional performance, but occurred repeatedly. One Chipping Sparrow remained on my hand five minutes and then flew away only because I forced him to. (Plate XV, fig. 1.) One Blue Jay, after lying on his back, perched on my forefinger, then swung himself around like a parrot, and hung there upside down, without my touching him in any way.

As more and more people take up this work, in stations all over the country, an increasing number of "returns" will be reported. Among them I am sure someone will find some of my old friends, such as Field Sparrow No. 22782, Chipping Sparrow No. 22781, (with a record of forty-one repeats), Mockingbird No.

57729, Cardinal No. 57735, or Blue Jay No. 57752, referred to above.

The totals of birds handled in a day fluctuated. The smallest number was ten, on April 7; the largest, one hundred and ninety-two, on March 21. Of course the fluctuation was due, in part, to chance; the birds did not happen to come to the traps in such numbers on some days as on others, or having come there, for some reason did not happen to go inside. But there are two definite explanations for this great difference in the days' totals. First, migration, the very thing that bird-banding is helping us to study. On March 24 I took 120 birds; the next day only 49. On the 24th the usual number of Chipping Sparrows had been flying around; on the 25th, very few were seen, and since they are by far the most largely represented species in my report, their relative abundance or scarcity was directly reflected in the total of birds trapped on any given day.

The second reason for the variation is important. If one puts too much food outside the trap, the birds will find all they want to eat there and leave without going inside at all. After the first few days, when my totals had been satisfactory, on March 17 I took only seventeen birds, in spite of the fact that there were a great many all around. Investigation showed that I had inadvertently sprinkled bait pretty liberally in front of the traps. So at dusk, when I baited them for the next day, I went to the other extreme: I put only a small handful of chick feed and only a very few crumbs outside, and increased the amount just inside the entrance. The next day I had 94 birds, and then 92 (on a day when the traps were not used after 3:30 p. m. on account of showers), 119, 192, 187, and so on. Thereafter on several occasions I was able to trace a drop in the number of birds to a relative increase in the liberality with which I had sprinkled the bait outside. I even tried experiments which tended to bear out my observations, leaving more food in front of one trap than another.

My large number of "repeats" was due mainly to the fact that as a rule I visited the traps frequently, five or six times some days, occasionally even oftener. This is not necessary except when one is likely to take nesting birds, but I had the time and found

it interesting. The more often I handled the birds, the more I learned about their habits, the better I became acquainted with them. And when there were eighteen birds in a single trap together, a thing which happened at least twice, it was high time to let them out and begin over again, even although some of them did go right back.

I banded birds of seventeen species, as follows: Mourning Dove, Red-bellied Woodpecker, Blue Jay, Florida Blue Jay, White-throated, Chipping, Field, and Song Sparrows, Slate-colored Junco, Towhee, White-eyed Towhee, Cardinal, Myrtle and Palm Warblers, Mockingbird, Brown Thrasher, and Hermit Thrush. The Field Sparrow, Song Sparrow, and Mourning Dove were the first representatives of these species to be banded at this station.

The Mourning Dove (Plate XVII, fig. 1) is especially interesting, for he was taken with an ordinary sparrow trap, although he is really far too large for it. In fact, he was apparently unable to go through the opening from the first compartment to the second, and I was obliged to take him by lifting the trap slightly and reaching into the first compartment, which has no bottom, a rather difficult feat, since it is almost impossible to cover all the space thus left open, and the bird has a good chance to escape.

All of the above birds, with the exception of the woodpecker, may be classed as ground-feeders. Most of them are seed-eaters, but not all; several of them normally look for a quite different sort of food. Most, if not all, prefer the bread to the chick feed, although the latter is necessary to attract them in the first place. The Red-bellied Woodpeckers seemed out of their element eating bread crumbs on the ground, yet one that was banded at ten o'clock was taken in another trap about 100 yards away at 1:30 the same day. It was amusing to watch them walk upside down on the top of the trap, pecking at the wires, and then to see them try to peck my fingers as I attached the band.

A visitor, to whom the work was a novelty, expressed the thought that it must be tiresome to handle the same birds over and over again. I imagine this idea is general among those to whom banding is still mainly a theory. They wonder whether this phase of the work has any real value. The banding of a new bird, or a

return record, has more value, naturally. But the repeat record also is worth while. One never knows when he may record a given bird's last appearance at the station. And when many stations are being operated all over the country, there will be unlimited possibilities for studying migration through a comparison of dates; then even the hour at which the bird was last taken will have a significance.

For instance, Chipping Sparrow No. 22807 was banded March 18. He was taken on March 19, 20 (3 times), 21, 22, 24, 25, 26, 27, 28 (twice), and 30. What became of him after that? Of course he may have been killed by a hawk or a shrike, or he may have died from some other cause. Perhaps he merely desired a change of diet! But it seems far more likely that during the night of the thirtieth he went on toward the north. Well then, how far did he go? Where was he the next day? How long did he stay there? Where did he finally settle down for the summer? What other Chipping Sparrows were with him? That is, did this bird and others banded on March 18, or near that time, continue the migration together?

Chipping Sparrow No. 22759 suggests questions of another sort. Banded March 13, he was taken on March 14, 18 (3 times), 19, 20 (twice), 21, 22, then April 5, 6, 8, and 10. Where was he on the thirteen days between March 22 and April 5? Was it merely a chance that he was not taken during all that time? Or did he leave the vicinity to feed elsewhere? If so, what sort of food attracted him? How far did he range? Many previous records at Thomasville, as well as some of my own, suggest that the birds concerned ranged over a comparatively small area. Mr. Baldwin's White-throated Sparrows, for example, apparently settled down for the winter in the vicinity of trap A. Traps B, C, D, and E were in different parts of the same weed-grown field, while A and AA, though not far away, were across a driveway in a large garden by the house. Now Chipping Sparrow No. 22785, for instance, was taken 36 times, always in one or another of the four traps mentioned, that is, in the same field of some three acres, never in either A or AA. Yet No. 22759 seems to have left that field. He was taken once under a net near A;

and as shown above, he disappeared entirely for thirteen days. Are some Chipping Sparrows more venturesome than others? At about the time when I missed No. 22759, I first noticed that many others were feeding in a similar, but much larger field, about a quarter of a mile away. Supposing someone had been operating one or more traps in that field; should we have found No. 22759 among the birds recorded there? What caused him to return to my traps April 5? And again, if I had been able to continue the work after April 10, how much longer should I have continued to take him? Did he nest in that field on Inwood Plantation? Or did he go on up through the coast states toward New England immediately after April 10? Or perhaps straight up north to Ohio? Will Mr. Baldwin take him at his farm near Cleveland this summer, or shall I find him on Lake Winnipesaukee? Are birds ever influenced to choose a nesting-site by food that they find at traps? Do the bread crumbs that we put out for them ever induce some to nest outside their ordinary range? And so on ad infinitum.

There are endless possibilities for speculation and study based on the statistics of the repeaters. Previous to April 1, 85 of the first 100 small birds banded (those requiring No. 1 bands), had repeated. After that time only 20 of these same 100 continued to visit the traps. Did those 100, roughly speaking, represent a wave of small birds, most of which had gone on by April 1? Perhaps there is no significance in these figures. But to me they suggest possible answers to various questions pertaining to migration. Note that I say they suggest; they do not prove anything, and cannot until many more people are trapping birds, in many localities.

Of the 356 birds handled, (new and "returns"), 245, or nearly 70 per cent, repeated, 171 of them more than once. That does not look as though they were frightened or injured by being trapped! These figures are even more significant when it is realized that the birds did not have equal opportunities for repeating; those banded during the last few days obviously had less chance than those taken during the first week, while the ones taken on the afternoon of April 10 had no opportunity at all.

I might go on indefinitely, pointing out interesting comparisons, statistics, and problems suggested by the records of repeating birds. But limits of space and time,—and perhaps of the reader's patience,—forbid further discussion along this line. But let no one think for a minute that "handling the same bird over and over again" becomes tiresome or is of no value.

Of the return records, by far the most interesting and most important is that of No. 19247, a Brown Thrasher banded by Mr. Baldwin at trap A, February 27, 1915, and taken again on March 13 of that same year. In 1916 he was taken three times, on March 4, 11, and 17, always in trap A; in 1917 three times, twice in A, March 11 and 13, once in AA, on the other side of the same house, on March 12. In 1918 and 1919 no trapping was done on the plantation, so that we have no way of knowing whether our Thrasher was there or not. But in 1920, he was there, being taken four times, February 16 and 20 and March 8 in AA, and March 11 in A. In 1921, although the traps were in operation, he was not taken, and it seemed reasonable to suppose that his history was completed. In 1920 he was at least six years old, since he was obviously at least one year old when banded; it would not have been unnatural if he had gone the way of all flesh in the meantime.

But this year he visited the traps more frequently than ever before. He was taken first March 28 at A, the same place where he had been feeding year after year. But his first appearance was later this year. Is he a migrant bird, and was he late in reaching the plantation? Or had he been there all the time, as a permanent resident, and was it a mere chance that I did not take him earlier? (Several times I had seen a bird with a band on his leg near the trap, but of course it was impossible to tell whether this was the famous No. 19247.) He had an automobile ride that day, to be photographed twice, held in the hand in the usual way, and suspended by the neck. (See Plate XVI.) In this latter position he was quiet, although ordinarily he was the most restless bird that I handled. I also removed his band, flattened it out, and had a picture taken of it. But alas! the thin metal had been bent once too often, and broke, as shown in the illustration;

a new band was thus necessary, and No. 19247 became No. 57742. To show that he was not discouraged, the Thrasher came back seven more times, March 31 and April 1 at AA, 2 at A, 3 at AA and A, 4 at A, and 8 at AA. This bird is now eight years old. How much longer will he continue to visit the traps at Thomasville?

Another returning Thrasher had to have a new band, No. 55227 became No. 57743. His old band was too small, and had pinched the leg. But note that while the leg was swollen, it was not, apparently, causing the bird any inconvenience or suffering. He was banded at C, March 26, 1921; I took him this year on March 27, at D, only a hundred yards or so away from the original place, and again on April 7 under the net in front of the house in which I was living, some two hundred yards from D.

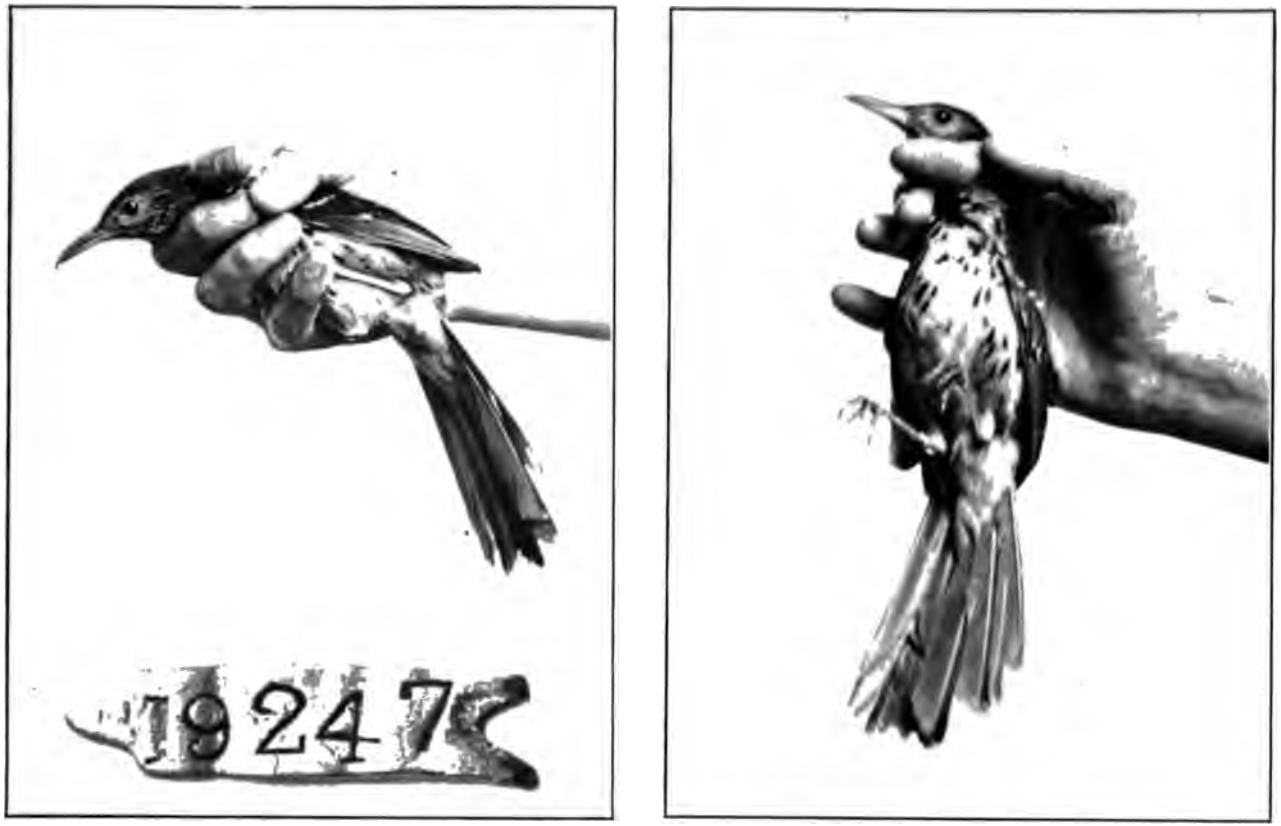
White-throated Sparrows, which have figured prominently in Mr. Baldwin's records for Thomasville, had already become scarce when I began my work there; most of those that evidently spend the winter around the house had started on their journey north. Still I took three White-throats which had been banded in 1921, thus linking up this year's birds with those of every other year for which we have records.

In addition to the birds already mentioned the list of return records includes 29 Chipping Sparrows, 1 Blue Jay, 4 Cardinals, 1 Myrtle Warbler, and 3 more Brown Thrashers, making a total of 43.

Thrasher No. 53085 is an interesting bird. He was banded February 19, 1920, at B; at some time previous to that date he had lost a foot; Mr. Baldwin made the following entry: "left leg off at mid-tarsus and well healed in a button." I took him March 22, 1922, at C in the same field as B, and again April 2 at A. His infirmity did not seem to trouble him in the least.

But this Thrasher was not the only bird with a deformity or injury. In fact, abnormal conditions were much more common than I had imagined.

A male Cardinal that I banded, No. 57732, was in much the same condition as the Thrasher. A female White-eyed Towhee, 55256, had no tail feathers, and was a funny-looking creature, literally "as big around as she was long." More than the usual percentage



1. THE FAMOUS BROWN THRASHER BANDED IN 1915 AND HIS BAND.
2. THE SAME BIRD IN A COMFORTABLE POSITION.

of Chipping Sparrows had diseased feet; 71 out of 287 (new and returns), or nearly twenty-five per cent. It is possible that being a beginner I noticed and recorded some very slight indications of disease that Mr. Baldwin, with his several years' experience, would not think worth recording; this would account in part for the great increase; (he has reported about ten per cent in past years). But on the other hand, it is certain that when handling a large number of birds within a short time, I failed to note many slight deformities, especially in the case of repeaters; and often a bird was in worse condition when he came back than when originally banded a week or more before. Hence it is likely that the disease is much more prevalent in some years than in others, as my figures seem to show.

This "toe disease" ranges all the way from a missing claw or two to an advanced stage in which the whole foot is badly swollen and bleeding. With as many birds to handle as I had at Thomasville, it is impossible to make a really satisfactory study of these symptoms; yet I was able to keep watch of some of the most notable cases, and to record changes from time to time. In some birds conditions became worse, and in some there was marked improvement. It should be carefully noted that these injuries are not in any way due to the trapping or banding of the birds. There is no relation whatsoever between them. They are caused by conditions over which man has no control; but for scientific trapping, we should never know anything about these diseases and abnormalities; through trapping and banding we may some time be able to prevent or lessen them.

A few comments must suffice as to the behavior of birds in the traps, in the gathering cage and in the hand, although to the operator this is one of the most fascinating of the many fields of observation opened by this work. Southerners that I met all cautioned me to be on my guard when handling Cardinals; "they are vicious birds," I was told, "and they'll give you a dig every chance they get." So I put on gloves the first two or three times I took these birds. Now they have very large, heavy beaks, and it is true that they will try to bite the operator's hand if possible. But it was difficult, if not impossible, to adjust a band with gloves;

I also discovered that while the Cardinal can take hold good and hard he cannot break the skin, and cannot cause any lasting soreness; in other words, the discomfort is so slight that no one but a mollycoddle need worry over it anyway. And I soon learned to hold the bird in such a way that he could not reach my finger with his beak. But almost invariably, after I freed the bird, he would stop just long enough to give me a "dig" before flying away. One beautiful male nipped me and then flew to the nearest tree and sang to me, as if to say that he regarded it all as a joke. It does not look as if he were frightened.

I found the Cardinal the easiest bird of all to drive into the gathering cage from the trap. In fact, "drive" is hardly the word to use in his case; usually Cardinals went into the cage at once, as soon as the doors were dropped. And there they remained until I could take them out; they did not run back into the trap, as other birds were apt to do. But the instant I started to reach into the cage, whether the bird saw my hand or not, (and usually his back was toward me, so that he could only "sense" the approaching fate), he began to squeal; and he continued to squeal, without any let-up, until freed. One Cardinal squealed so little, only six or seven times, as to cause special comment in the records.

White-throated Sparrows frequently tried to bite; and for a small bird, the White-throat is quite a scrapper. But of course he is too small to hurt one. The Thrashers are well named. They invariably thrashed around the trap, and usually after going into the cage they thrashed out again so quickly that I wondered how in the world they could turn around with such lightning-like speed. But once in the hand, the Thrasher was easy to handle and as gentle as the proverbial lamb.

Strange as it may seem, the Blue Jay impressed me as about the gentlest bird of all. When one stopped in the middle of a house trap, looked straight up into my face, and said, "yarrup," I was quite ready to forgive him all his sins. All the Jays that I took were very easy to handle. Only once did one nip me. To be sure, their claws did sometimes hurt a little as the birds closed them around my finger in perching there, but we can hardly blame them

for that; no doubt their claws were meant to be sharp. The Jays even submitted without protest to the various measurements that were necessary to determine whether they were Blue Jays or Florida Blue Jays.

Of the Chipping Sparrows, very few struggled or were at all restless. Some squealed, some were perfectly quiet. Nearly all seemed to want to "cuddle." Some went readily into the gathering cage, more went only after considerable urging, while in a few cases it was impossible to drive the bird at all, and it was necessary to put my hand cautiously into the trap and take him out. I am bound to say that my experience with Chipping Sparrows has not increased my respect for their intelligence! No. 22735 never learned, with all his forty-five visits, to go through the door when it was open in front of him; he always wandered back and forth, not realizing that there could be more than one side to the compartment, until I am afraid that sometimes my language was not very polite! Of course I talked to the bird; that goes without saying. But then, I do not believe he cared!

My reference to the two kinds of Blue Jays illustrates one group of questions that may be answered through trapping. It happened that I banded four of each kind; but that does not prove that the two are represented in equal numbers at Thomasville or in Georgia at this season. But this is only one of a number of similar problems that bird-banding may be able to solve. Are all the Chickadees in that region Carolina Chickadees, or do the Black-capped Chickadees, the species so common in the north, ever venture so far south? Are there Downy Woodpeckers, as well as Southern Downy, and Hairy, as well as Southern Hairy Woodpeckers present in the winter?

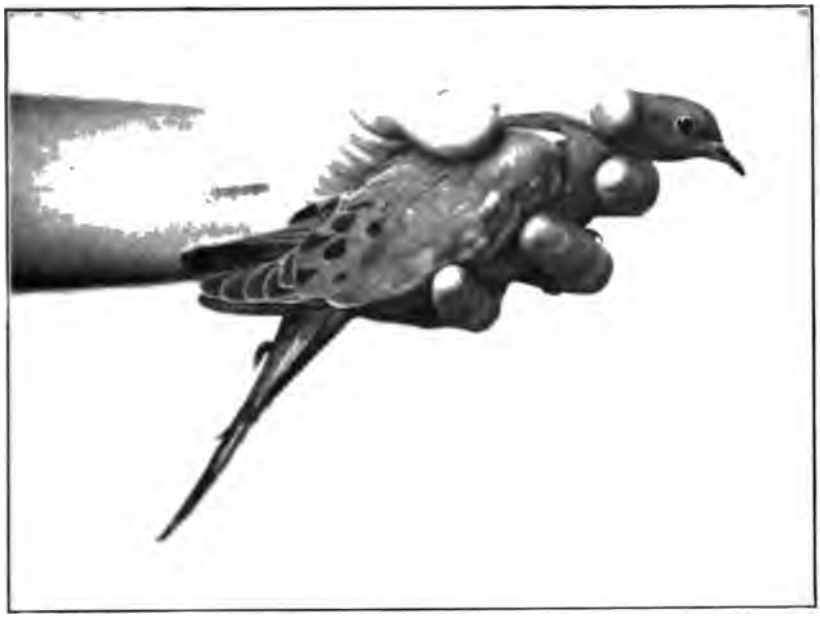
How shall we answer these questions to a certainty? How shall we trap birds of quite different habits, with which little or nothing has yet been done,—Warblers, Vireos, Flycatchers, Kinglets, Nuthatches? There is need both of traps suitable for these and other kinds of birds, and of bait that will tempt them. For as already pointed out, the work described in this article has been mostly with seed-eaters; both experience and common-sense tell us that we can hardly expect to take in the same way many of the little insectivorous birds that flit about the tree-tops.

Perhaps it will be well to describe briefly the equipment used and the locations of the traps, although it has been assumed throughout that the reader is already familiar with articles published previously by Mr. Baldwin, and with directions for trapping distributed by the U. S. Biological Survey.

For bait, I used the best quality of chick feed and bread crumbs. I found slightly stale bread easier to crumble, and quite as acceptable to the birds as fresh bread; the latter is apt to become soggy or "doughy."

I had four Government sparrow traps, all in a weed-grown field; three of them were at intervals of a hundred yards in a straight line from south to north, the fourth at about the same distance from this line, across the field to the east, and beside an old well overgrown with honeysuckle vines, an admirable place for birds. In addition, I used two house traps, similar to the one described in Circular 170 of the Biological Survey, only mine were two feet high instead of five. My experience with these led me to believe that the door which is left ajar to permit the birds to enter should be wide enough to admit the operator as well; for with a trap as large as this it is sometimes desirable to go in, as a bird that has gone into the box frequently comes back into the trap before the operator can get around to close the door and take the bird. Naturally, with a trap two feet high, it would be necessary to go in on hands and knees; but in this work one should expect to wear clothes that cannot be damaged by such a trifle. Possibly, however, some arrangement can be devised with a door swinging into the trap and up, that will obviate this necessity. Any door sliding up and down in a groove should be provided with a peg, to prevent it from slipping and injuring the birds.

Finally, I had two net frames, and while these did not take many birds, they did furnish considerable fun; for it was with one of these that I trapped while I ate, as previously stated. When the weather permitted, and it usually did, I took my meals on the front piazza. Now about thirty feet in front of this piazza was one of the net frames, a square frame with a net over the top and a small swing door through which to drive the birds into the





1. MOURNING DOVE. THE FIRST ONE BANDED AT THOMASVILLE.
2. BIRDS ALMOST ALWAYS LOOK ONE STRAIGHT IN THE EYE.

box; a short stick held one side up away from the ground, while a string attached to the stick permitted the operator to let down the frame when he observed a bird safely feeding under the net. Of course this arrangement has its limitations. In order to capture a bird, the operator must be on the spot at the psychological moment. But that was precisely the situation; with the string leading to my dining-table on the piazza, the psychological moment sometimes coincided with the gastronomical moment; and then a slight tug, and I put down fork or spoon and attended to the captive bird. On one such occasion I "netted" eight Chipping Sparrows at one fell swoop!

In conclusion, let me give a summary in tabular form, of the results of my work at Thomasville this year. In thirty days I banded a total of 313 individual birds, as follows:

258 Chipping Sparrows	2 Field Sparrows
12 Cardinals	2 Towhees
7 White-throated Sparrows	2 Red-bellied Woodpeckers
5 Juncos	1 Mourning Dove
5 White-eyed Towhees	1 Hermit Thrush
4 Blue Jays	1 Myrtle Warbler
4 Florida Blue Jays	1 Palm Warbler
4 Brown Thrashers	1 Song Sparrow

I took forty-three birds previously banded, ("returns"), as follows:

29 Chipping Sparrows	3 White-throated Sparrows
5 Brown Thrashers	1 Blue Jay
4 Cardinals	1 Myrtle Warbler

These 356 birds repeated in the aggregate 1448 times, making a grand total of 1804 birds handled.

The possibilities of this work are limitless. It is by far the most fascinating sort of bird-study imaginable. The contributions it can make to the scientific knowledge of birds are of inestimable value. The work is within the reach of all, or at least of all who have a suitable location for a trap; it involves but little expense, and requires no great experience and little ornithological knowledge.

The results will increase in geometrical progression as the number of bird-banders increases. And we may confidently expect that more and more people will actively take up the work as its possibilities become better understood.

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BIRD NOTES FROM NORTH GREENLAND.

BY LANGDON GIBSON.

UNAVOIDABLE circumstances have until now prevented the putting in shape of my notes, on birds, observed during the first Peary Expedition of 1891–92, of which I was the ornithologist. The fact is, immediately upon my return from Greenland, I married, and, putting aside all thoughts of exploration, became associated with the General Electric Company, of Boston, afterwards moving to Schenectady, N. Y. The company at this time was growing with leaps and bounds, and what little time I had at my disposal was spent in outdoor sports; and now after thirty years, having been sent south for my health, with strict injunctions to give no thought to business, what greater pleasure could come to me, living, as I am, in a little shack on a Florida Key, than to bring out my Arctic Journal, and review my bird notes[1] for publication in 'The Auk'?

On the sixth of June, 1891, we sailed from the foot of Baltic St., Brooklyn, N. Y., bound for North Greenland on the Barkentine-rigged Steam Sealer, "Kite." As we steamed through Long Island Sound, enthusiasm ran high in anticipation of the adventures which were to be ours during the ensuing year; and after the usual vicissitudes attending ice navigation, early in August, we established

[1] A report on this collection by Witmer Stone will be found in the Proceedings of the Academy of Natural Sciences of Philadelphia for 1895 pp. 502-505. Dr. Stone witheld this report for some time in the hope that I would be able to get my field notes in shape to accompany it, but was finally forced to publish it alone. A report on the collection made by Dr. Wm. E. Hughes, ornithologist of the West Greenland Expedition, which accompanied the Peary party to their headquarters in 1891, was published by Dr. Stone in the Proceedings of the Academy for 1892, pp. 145-152. Both of the collections are in the Academy Museum.

winter quarters in Greenland two and one third miles from Cape Cleveland, on the southern shore of McCormick Bay, in latitude 77 degrees and 40 minutes North, and longitude 70 degrees and 40 minutes West.

Our house was placed about thirty feet from the beach, and about ten feet above sea level; the surrounding country was not particularly fertile, but here and there among broken rocks grew a liberal sprinkling of long grass and the omnipresent Arctic Saxifrage, with its pretty little purple flower. Immediately back of our house were some brown trap rocks presenting a front two or three hundred feet high, where a pair of Northern Ravens had nested. Back of these rose the iron-stained cliffs, from which, most appropriately, our house was named, by Commander Peary, "Red Cliff House."

McCormick Bay cuts a wedge-shaped gash seventeen miles deep into the rugged coast of North Greenland, and is almost entirely bounded by cliffs of igneous rock, ranging from one thousand to eighteen hundred feet in elevation, with here and there a valley of rather steep ascent, offering access to the inland ice or "Mer de glace" above and beyond.

During the short summer, flowers bloomed in abundance along the grassy slopes at sea level, while at the head of our bay, lay a fertile valley abounding in Reindeer (Tucktoo, as the Eskimo call them), Blue Foxes, and Arctic Hares. In the center of this valley, a fresh water lake, four or five miles in length, extended back to the great shadowy cliffs, which held the "Mer de glace" in check. At the north-east corner of the bay, the Sun Glacier calved its inexhaustible supply of bergs into our waters, and in the summer months, great Cathedral-like paleocristic masses of ice bound south, drifted lazily on their way to plough furrows in the Tosca Banks; while a little farther to the westward lay the Five Glacier Valley, perhaps the most salubrious and fertile of them all, and where we did most of our hunting. The entrances to our bay were guarded on either side by two imposing capes: Cape Cleveland, a typical bastian headland at the south, while six or eight miles to the north rose Cape Robertson. Fifteen miles to the westward in Whale Sound, three rugged islands stood like sentinels, Herbert,

Northumberland, and Hakluyt; their bold outlines often appearing distorted by mirage. It was amid such surroundings that I made the following observations.

1. **Gavia stellata.** RED-THROATED LOON. Eskimo, *Kark-sough.*—A common summer resident. Last seen on September 19, 1891, and the first observed at Cape Cleveland June 8, 1892; soon became common, and by June 20, had begun mating. Almost every fresh water lake and pond, in the valleys at the head of the bay, contained a pair of these birds. They were exceedingly shy, and always preferred flying to diving, as a means of retreat, whereas when chased in the open sea, they would invariably seek safety by diving.

On July 9, I procured two fresh eggs from a nest in Tucktoo Valley. The nest was placed upon a small tussock some three feet in diameter, lying about midway between the shores of a small pond. It was a rude affair and concealed by a luxuriant growth of long rank grass, and was composed of a matted mass of wet weeds. In attempting to reach it, I was compelled to proceed with great care, owing to the fact that the bottom of the pond was exceedingly slippery, caused by a coating of ice still adhering to it. These small ponds freeze solid in the winter, and the ice melts from the top down. As might be expected, the entire congealing of the water of these ponds in winter, means that there is no food supply to be found there. The result is that parent birds make excursions to the open seas, where, after satisfying their own appetites, they bring small fish to their offspring. A young bird collected in a pond at Herbert Island had its crop well filled with small salt water fish.

Specimen taken in Five Glacier Valley July 10, 1892. Length 25.25 in. Ex. 42.75 in.

2. **Fratercula arctica arctica.** PUFFIN. Eskimo, *Kill-ing-gah.*—While at Hakluyt Island on August 18, 1891, one pair of these birds were seen inhabiting the same cliffs upon which the Brünnich's Guillemots bred in countless numbers. This was the only pair observed during our stay in North Greenland. They undoubtedly bred in the cliffs, as after each gun discharge, when thousands of Guillemots were leaving their nests in great clouds, the pair of Puffins would leave the cliff and shortly return to the same niche, which was at least one hundred feet above the sea level.

3 **Cepphus mandti.** MANDT'S GUILLEMOT. Eskimo, *Soh-gwah.*—A summer resident. Common at Cape Cleveland, where probably upwards of twenty pairs bred. The nests were generally placed about thirty or forty feet above the sea, in the very inaccessible niches of the cliff. Another small colony of these birds, was noticed in Hakluyt Island, in the low regions of cliffs adjoining the loomery of *Uria lomvia.*

4. **Uria lomvia lomvia.** BRÜNNICH'S MURRE. Eskimo, *So-gwah.*

Next to the Little Auk these birds outnumbered any other species seen by us, but as they bred in colonies they were not very widely distributed. A vast number of these birds inhabited the steep perpendicular cliffs which formed the northern boundary of Hakluyt Island. We visited this loomery on August 16, 1891, and while some distance off, observed scattering birds flying from the island to their feeding grounds, and back, each of those flying toward the island carrying in its mouth a small fish for the nestlings, that by this time, had no doubt made their appearance.

As we approached the focus of their activities, they appeared in greater numbers, and upon finally reaching the cliffs the scene was truly bewildering. A heavy surf was breaking upon the perpendicular cliffs and above the roar of the breakers was heard the discordant cries of thousands upon thousands of these birds that left the cliffs in mighty whirring clouds at each gun report.

We were compelled to exercise extreme caution in picking up dead birds, keeping our whale-boat stern on shore, and when a dead bird was picked up, vigorous strokes were generally required to prevent piling up on the rocks.

They were first seen in open water at Cape Cleveland, June 6, 1892; and a female taken here on June 18 had a perfectly formed egg in her body, ready to deposit. Their flesh was most palatable, and not in the least fishy, as might have been expected.

5. **Alle alle.** DOVEKIE. Eskimo, *Ak-pal-i-ark-so-wah.*—This little bird is a staple stock commodity in nature's great department store and plays an important part in the domestic economy of the North Greenland Eskimo. It is a summer resident, breeding in immense colonies, and wherever a convenient talus of broken rock presents itself, there you will look for their nests. The largest loomery near Red Cliff House, was in Robertson Bay, next to, and north of McCormick Bay, while other large loomeries exist on the southern shores of Northumberland and Hakluyt Islands. They were first seen in the open water at Cape Cleveland June, 8, 1892. Eggs were brought to me by natives from Robertson Bay on June 30, but incubation was already so far advanced as to make it difficult to preserve them.

The Little Auk, like the Snow Bunting, seeks shelter for its nests beneath rocks. They lay but one pale blue egg about the size and shape of a Quail's egg.

In the morning hours during breeding season, countless thousands of these birds were to be seen, in flocks ranging from fifty to five hundred, flying to and from their nesting sites, to the feeding grounds or open water, which at that time lay well out in Whale Sound, where a small shrimp—their principal food—was most plentiful. The Little Auk, due to its habit of depositing its egg early in summer, before the ice has passed out of the bays, is compelled to travel long distances to open water for its

food; and in consequence nature has provided small pouches or receptacles in the bird's throat, which they fill with from four to six shrimp, after supplying their own requirements. These are carried back to the hungry nestlings. Here we have a possible explanation for only one egg to the nest as the question of food supply for a larger family would become a serious problem.

The Little Auk, although a strong and swift flier, accomplishes its long flights by an apparently heavy expenditure of energy. Their wings are short and remarkably small in proportion to the bulk of the bird; and they drive themselves through the air at great speed by rapid vibrations of the wing, making a high pitched, whirring noise, which is so multiplied in a large flock, as to make it possible to hear them, especially when they are flying high before, or at least quite as soon as, they become visible to the eye. They fly in flocks at different levels, from ten to one thousand feet, and occasionally a flock drops several hundred feet to sea level, with a tremendous rush of wings and again occasionally dives, from elevations of one hundred feet, or less, into the water.

I have seen the surface of McCormick Bay, for miles in extent, covered with a pinkish scum, the droppings of these birds. When the flight was on, they passed in such numbers over our house, that we found it necessary to take in the bedding that had been put outside to air. Some of the naturalists in returning on the "Kite," preserved with great care, in small bottles, specimens of snow discoloured by the droppings of the Little Auk, believing at that time that they were securing samples of the "protococus nivalis"—the name assigned to the microscopical plant which, if it exists at all, is at least not fairly entitled to the credit for all of the red snow found within the Arctic Circle.

During the breeding season, the Little Auk is netted in great numbers by the Eskimo at their nesting sites. The skin is removed by turning it inside out through the neck, by means of stretching; an operation requiring much skill, and at which the Arctic Highlanders are adepts. The bodies are eagerly devoured by the natives, while the skins, after being properly dried, and afterwards chewed, or rather mouthed into pliability by the women, are made into garments or shirts, which are worn with feathers next the body under the seal skin "netcher." Approximately two hundred and fifty such garments are needed each year to supply the Arctic Highlanders and as it requires at least fifty skins to make a shirt, it will be seen that twelve thousand five hundred birds are used annually for this purpose alone, while no doubt many times this number are taken each year for food.

The Blue Fox also levies toll, for on the highest part of Hakluyt Island on August 18, 1891, we found a cache of twenty or more Little Auks, the winter's supply of a provident fox.

In spite of the heavy demands made upon this chunky little bird. I

am forced to the conclusion, judging from personal observation, that the total number destroyed each year forms but a negligible percentage of the vast horde of this bird which literally swarms in north Greenland.

6. **Stercorarius parasiticus.** PARASITIC JAEGER.—Eskimo, *Ish-in-gwah.* This trim highwayman was common in our bay, but I could obtain no satisfactory statements from the Eskimo as to its nesting habits.

One day a female Eider appeared flying low in great distress, closely pursued by a Jaeger. The duck was evidently fatigued, for when it got near me it began tactics of zigzagging. The Jaeger did not actually strike at the duck, but kept aggravatingly close. The duck finally alighted, the Jaeger doing likewise within a few feet, and after considerable bobbing up and down the Eider succeeded in regurgitating; after which it waddled away a few feet, shook itself, gave its tail a wag or two, and with a quack took to wing again, while the unruffled Jaeger, apparently fully satisfied with the results obtained, walked over to the pile of semi-digested food, and proceeded to dine.

First observed at Red Cliff House June 12, 1892. The following measurements were obtained:

Red Cliff House, July 13, 1892. Male. L. 18.25 in. Ex. 41 in.
Red Cliff House, July 13, 1892. (undetermined) L. 19.50 in. Ex. 41.37 in.
Tucktoo Valley, July 23, 1892 Male L. 20.50 in. Ex. 43.37 in. Tail 8.12 in.

7. **Stercorarius longicaudus.** LONG-TAILED JAEGER. Eskimo, same as Parasitic Jaeger.—Birds of this species were taken as follows:

Tucktoo Valley, July 15, 1892. Male, L. 21 in. Ex. 36.50 in. Tail 11 in.
Tuckatoo Valley July 22, 1892. Male, L. 22.25 in. Ex. 38 in. Tail 12 in.

8. **Pagophila alba.** IVORY GULL. Eskimo, *Noy-erwe-Ah-ho.*—Not common at Red Cliff, preferring the more open waters of Inglefield Gulf. A specimen was brought in by one of our natives, having been snared by means of a seal skin noose ingeniously placed near the carcass of a seal which had been butchered on the sea ice about six miles off shore.

In July, 1891, while on a voyage north in Melville Bay, a Polar Bear was observed approaching the ship. The bear was being badgered by three of these birds, which kept making successive swoops at him, and so closely did they approach that the bear would snap at them quite dog like and taking a few jumps in their direction, with grace and surprising agility, would rear to his full height, and standing erect, cuff at his tormentors with his mighty fore arm—a blow that the gulls were careful to avoid.

An immature male and female were taken in Melville Bay by Dr. Wm. E. Hughes on July 5 and 6, their wings and breasts showing blackish markings.

A specimen was taken in McCormick Bay on July 17, 1892.

9. **Rissa tridactyla tridactyla.** KITTIWAKE. Eskimo, *Tata-rah.*—A summer resident. A few pairs bred in the bird cliffs at Hakluyt Island. Their nests were bulky affairs placed well above the sea, and seemed from the best views we could obtain, to be composed mostly of dry sea weed and mosses. Like *Pagophila alba* these birds also seemed to prefer the open sea for their hunting. They appeared at Red Cliff House July 24, and were plentiful until our departure for home about the middle of August, 1892.

10. **Larus hyperboreus.** GLAUCOUS GULL. Eskimo, *Noy-ah.*—Along the southern shores of Northumberland and Herbert Islands, five hundred feet or more above the sea level, these birds bred in large numbers. In August, 1891, I cruised along close to the shores of these islands in an open whale boat and found the beach lined for miles with the young birds in gray plumage. A Blue Fox, stopping occasionally to bark at us, was trying its best to stalk them. After repeated failures, which always ended by the particular bird selected flying away to safety and with it all the other birds in the immediate vicinity, the fox lost self control and would sit on its haunches with head thrown back and cry as though its heart would break.

At the head of Five Glacier Valley, on Friday, August 19, 1892, while hunting for a lost companion, — who was never found, I witnessed a remarkable performance. I quote from my journal:

"I passed several lakes and came to the end of the valley and what an impressive sight. It ended abruptly against the perpendicular wall of a great glacier. I saw no signs of the balance of the party who were hunting in my direction, via Robertson Bay, and decided to wait for them at this point. It was beginning to snow, and above me I could hear the harsh cries of the Little Auks, as they returned in flocks from the feeding grounds, and occasionally the hollow scream of the Glaucous Gull. Every now and then the old glacier would send off a report like muffled thunder, as some new crack appeared on its mighty surface. Suddenly a young Little Auk, (its first flight no doubt) appeared directly above us, its body almost perpendicular, wings beating the air vigorously. Its flight was feeble and no match for a giant Glaucous Gull coming behind, which seized the Little Auk in its mouth and gulped it down whole without altering its course."

When returning from the inland ice on June 2 and still out of sight of land, when almost abreast of the Humboldt Glacier, at an elevation of perhaps three thousand feet, I observed a flock of eight of these Gulls flying far above our heads, travelling in a northerly direction. On June 10 they had appeared in large numbers. The stomachs of a number of them that we examined, contained clam shells and whelk eggs. The young ones, which were much less shy than the parents, were seen flying about during the early part of August. Last seen October 13, 1891.

Scrawny young birds not quite ready to fly are killed in considerable numbers by the Eskimo, who devour them raw and undrawn with great relish.

Specimens taken as follows:

Red Cliff House, Male, L. 25.25 in. Ex. 59.75 in.

Tucktoo Valley, June 1892, Male, L. 29.50 in., Ex. 65.25 in.

11. **Sterna paradisaea.** ARCTIC TERN. Eskimo, *Imer-ko-talia.*—Probably bred on shores of our bay; first seen in Five Glacier Valley, June 16, 1892, and continued common throughout the summer. This was the only bird observed that could put the Jaegers to flight. On June 18, in this same valley I saw a Jaeger chasing one of these Terns. The latter was quickly joined by five of its companions with the result that the tables were quickly turned, and the Jaeger was glad to call off the hunt.

Specimen taken as follows:

Five Glacier Valley, August 12, 1892. Male.

12. **Fulmarus glacialis glacialis.** FULMAR. Eskimo, *Karle-out-luk.* Whalers, *Nann, Molly.*—Seldom strayed into McCormick Bay. One observed in August 1891, near Hakluyt Island, and again a single bird seen on July 28, a few miles from Cape Cleveland. The natives knew nothing of their nesting habits. On the voyage north they followed the ship, much after the fashion of gulls, until we were well into the ice of Melville Bay.

13. **Clangula hyemalis.** OLD SQUAW. Eskimo, *Argly.*—Bred in numbers at the head of McCormick Bay. Although, in spite of persistent search, I was unable to locate a single nest, I found in the body of a female killed at the head of our bay on June 22, 1892, a perfectly formed egg with a hard shell. These birds first appeared in the open waters at Cape Cleveland on June 6, 1892. Their principal food consists of shrimps and small mollusks.

We found the flesh of these birds palatable, and entirely free from any flavour of fish, quite different from the birds taken in Long Island Sound. No doubt this absence of fish flavour was due to change of diet.

Specimens taken as follows:

Five Glacier Valley, June 16, 1892, Male L. 22.50 in. Ex. 30 in.

Tucktoo Valley, June 21, 1892 Male, L. 21.62 in. Ex. 28.50 in.

Tucktoo Valley, June 22, 1892, Female, L. 15.25 in. Ex. 26.50 in.

14. **Histrionicus histrionicus.** HARLEQUIN DUCK.—A flock of about twenty males seen in Robertson Bay early in August, 1892. They were exceedingly shy, and on approach, took to wing. Quite likely the Harlequins separate by sexes prior to migration as do the Eiders. The presence of these birds in Robertson Bay, gives credence to the belief that they breed as far North as 78 degrees North Latitude.

Camptorhynchus labradorius. LABRADOR DUCK. Eskimo, unknown.—Hoping to add to the world's knowledge of this species, I went north armed with pictures of this duck, given me by my very dear friend, the

late Wm. Dutcher. The information obtained by me was negative, and here follows my report to Mr. Dutcher, which was printed in the 'Auk,' Vol. XI, No. 1, January, 1894.

Friday, June 12, 1891, we reached Sidney, Cape Breton, but made no inquiries, as we saw no one who would be likely to know anything about the species.

Monday, June 15, while passing through the Straits of Belle Isle we stopped long enough to catch some codfish. Here we were boarded by some French Canadians. I showed each one of them the plates of the Labrador; they had never seen such birds.

Saturday, June, 27, we reached the settlement of Godhavn, Disco Island, Greenland. Here careful inquiries were made among perhaps a dozen hunters of the tribe. They also, through an interpreter (a Dane), said they never had seen the bird.

Leaving Disco we proceeded by slow stages, owing to heavy ice in Melville Bay, to our final camping grounds on McCormick Bay. During the ensuing winter every male Eskimo in the tribe came to visit us, and so, from time to time, I questioned nearly every one of them on this subject, showing each my picture of the duck. On first seeing the picture, with few exceptions, each native exclaimed that they had "Tarkkooed-emis-u-ah," meaning by this that they had "seen many." They gave the duck the name "Argly," and told me in the spring I could get many, also their eggs, at the head of our own bay. I was disappointed, when spring came, to have my Labrador Duck materialize in the form of the Long-tailed Duck, which, sure enough, was very plentiful in the head of the bay.

In August, 1892—the latter part I believe—on our way home we touched at Godthaab, the largest town in Greenland. Here we were entertained by Herr Anderson, the Danish inspector of South Greenland, an accomplished naturalist, and at his house I had the pleasure of inspecting one of the finest collections of arctic birds I have ever seen. I showed him my little pamphlet on the Labrador Duck, and also presented it to him on my departure. He told me that his collection represented twenty years' work, and all the hunters in South Greenland (some five hundred men), had instructions to bring to him any strange birds that they might get. In this way, he added to his collection from time to time many rare birds and eggs. In all this time he claims to have heard nothing of the Labrador Duck, which I consider is substantial proof that within the last twenty years the Labrador Duck has not visited Greenland. From Godthaab we came directly home to Philadelphia, and this ended my ineffectual attempts at learning something more definite regarding this species.

15. **Somateria mollissima borealis.** NORTHERN EIDER. Eskimo, *Metek.*—Found breeding in immense numbers on the Duck Islands, three low lying islands in Melville Bay where the "Kite" touched on the voyage north. Probably, upwards of ten thousand pairs bred in this

sanctuary, free from the ravages of the Blue Fox. The males were still with the females and usually stood sentinel near the nest, while the female covered the eggs.

Egg laying must begin at about the same time, in these large nesting communities, for of the five hundred nests found all eggs examined were in a uniform advanced state of incubation and about ready to hatch, while not a single young bird was to be seen on, or in, the waters surrounding the island. The majority of nests found contained four eggs, other nests had only three, and but three of the nests held six. Two undersized, infertile eggs were collected.

The nests were exceedingly dirty, and although well supplied with down, could almost be picked up "enbloc." Eider down no doubt has to undergo many cleansings before it becomes fit for the market.

The Eiders were summer residents at Red Cliff and bred in our bay but in no such quantities as on the Duck Islands.

First appeared at Cape Cleveland on June 6, 1892, where a set of five fresh eggs was taken on June 20, one of the eggs having a soft shell. By July 26, when hatching was completed, males began gathering in large flocks, and by August 5, had disappeared, leaving the females to guide the young ones south.

Cape Cleveland, June 27, 1892, Male L. 22.50 in. Ex. 39 in.

Red Cliff House, July 3, 1992, Female L. 21 in. Ex. 35.25 in.

16. **Somateria spectabilis.** KING EIDER. Eskimo, *Metek-we-aho.*—The elegance and good taste displayed, in fact lavished, on the male of this species fascinated me.

On June 21, 1892, a female was taken in Tucktoo Valley with ovaries much enlarged, and on July 9 I collected in this same valley two sets of fresh eggs, three and four, respectively. The nests, well lined with down, were small and well concealed in tussocks of grass, lying midway between the shores, or small ponds well out of the way of any predatory fox and at each nest the male stood watch while the female kept the eggs warm.

The fatness of these birds was remarkable; their intestines were embedded in a solid lump of fat from which dripped, upon being squeezed in the hands, a clear, colourless and odorless oil.

The following measurements were obtained:

Tucktoo Valley, June 21, Male	L. 23 in.	Ex. 36.37 in.
Tucktoo Valley, June 21, Female	L. 21 in.	Ex. 37.37 in.
Tucktoo Valley, June 22, Male	L. 22.25 in.	Ex. 38 in.
Tucktoo Valley, June 23, Male	L. 22.50 in.	Ex. 38 in.
Tucktoo Valley, June 22, Male	L. 22.25 in.	Ex. 37.50 in.
Tucktoo Valley, July 15, Female	L. 21 in.	Ex. 37 in.

17. **Chen hyperboreus nivalis.** GREATER SNOW GOOSE. Eskimo, *Kang-ou.*—It was my good fortune to record, for the first time, the breeding of this species in North Greenland.

A family was found in Five Glacier Valley on July 11, 1892. The male disputed my advance with head lowered and much hissing, quite after the fashion of the barn-yard goose, and before I was aware of the existence of goslings I shot the female. Then I took two of the goslings, that were about two weeks old, leaving the gander to rear the remaining six.

The birds were on the nest at the time of capture. The nest itself was well lined with grasses, and placed near a pile of broken stone, beside a marshy spot some acres in extent and about one hundred yards from a shallow pond.

On August 21, when again passing through the valley, I was happy to see the male proudly marching at the head of his family of six at least ten miles from the nest. As he had a broken wing, and his family then had every indication of being able to shift for themselves, I reluctantly, and in the interest of science, dispatched him.

The following measurements were taken:

Five Glacier Valley, July 11, Female, L. 30.50 in. Ex. 59.50 in.

Five Glacier Valley, Aug. 21, Male, L. 28 in. Ex. 50.50 in.

18. **Branta bernicla glaucogastra.** BRANT?—On June 6, a flock presumably of these birds, was observed flying high in a northerly direction.

19. **Canutus canutus.** KNOT. Eskimo, *Ting-ma-tear.*—First seen in Tucktoo Valley, June 11, 1892, appearing in small flocks of from ten to twenty birds. A week later they were to be seen in pairs and it was then I searched faithfully for a nest, without success.

On July 11, however, while walking along a sandy stretch of ground, sparsely covered with vegetation and not over one hundred yards from the shore of McCormick Bay, in Tucktoo Valley, I flushed an anxious female. Half an hour's search was finally rewarded by finding two young birds in the down. They were closely huddled together, facing in opposite directions, and made no attempt to escape. The birds were so small, that, even though there was no sign of a nest, I looked carefully but unsuccessfully for traces of egg shells.

Measurements taken as follows:

Tucktoo Valley, June 22, Male, L. 10 in. Ex. 19.50 in.

Tucktoo Valley, June 22, Male, L. 10.62 in. Ex. 21 in.

Tucktoo Valley, July, 10, Immature, L. 7.25 in. Ex. 13 in.

Tucktoo Valley, July 11, Female, L. 10 in. Ex. 19 in.

20. **Arquatella maritima maritima.** PURPLE SANDPIPER.—Although none of these birds were seen in our neighborhood Dr. Wm. E. Hughes collected on the Duck Islands, in Melville Bay, on July 22, 1891, a nest containing two fresh eggs. The female was also taken.

21. **Crocethia alba.** SANDERLING. Eskimo, *Ting-ma-tear*—A summer resident, common, and breeding in considerable numbers, bothin the Five Glacier and Tucktoo Valleys.

On July 11, I caught two very young birds in down. In spite of their

tender age, they were strong runners and while holding them the parent birds, trailing one wing on the ground, ran hither and thither within five or six feet of me, thus making the identification sure. The fact of finding but two young ones, and of finding but two young Knots, leads me to suspect that these birds lay but two eggs. Their natural enemies, however, such as the Blue Fox, the Parasitic Jaeger, and Glaucous Gull, which abound in these valleys, might readily account for the disappearance of a stray chick or two.

In the stomach of the male taken in Five Glacier Valley I found six large grubs each about one inch long.

Measurements taken as follows:

Five Glacier Valley, June 14, Male L. 7.50 in. Ex. 15 in.

Five Glacier Valley, Aug. 12, Female L. 7.87 in. Ex. 14.75 in.

Five Glacier Valley Aug. 12, Male L. 7.50 in. Ex. 14 in.

22. **Charadrius hiaticula.** RINGED PLOVER. Eskimo, *Ting-matear.*—In the late fall of 1891, at the head of our bay, I rescued one of these birds that had become imprisoned in a thin skim of ice. Its eyes were closed, and it seemed fully resigned to the fate that awaited it, had I not happened along.

First made its appearance at the head of our bay June 5, 1892, and probably bred there.

Measurements taken as follows:

Five Glacier Valley, June 16, Male L. 7 in. Ex. 15.25 in.

Five Glacier Valley, June 22, Male L. 7.50 in. Ex. 15.25 in.

23. **Arenaria interpres interpres.** TURNSTONE. Eskimo, *Ting-matear.*—These birds were first seen in Tucktoo Valley June 21, and again on July 15. Although no nests were found, they undoubtedly bred in our neighborhood. By the middle of August they were assembling in large flocks in company with the Sanderling and were last seen August 18.

Stomachs examined contained insects' legs.

The following measurements were taken:

Tucktoo Valley, June 21, Male L. 9.25 in. Ex. 18.37 in.

Tucktoo Valley, July 15, Female L. 9.50 in. Ex. 18.75 in.

Five Glacier Valley, August. 13, Female L. 8.87 in. Ex. 18.87 in.

24. **Lagopus rupestris reinhardti.** REINHARDT'S PTARMIGAN —A female taken on the shores of Inglefield Gulf near Cape Cleveland on April 21, 1892, L. 14.25 in. Ex. 23.25 in.

A male secured in Five Glacier Valley on April 23, L. 15.25 in. Ex. 26.62 in.

These birds were taken by Commander Peary with rifle ball, and the skins were too much mutilated for preserving.

25. **Falco islandus.** WHITE GYRFALCON. Eskimo, *Kerk-ker-sher-wearho.*—From the deck of the "Kite" while she was at anchor in the harbor

of Godhaven, Disco Island, on June, 28 1891, I witnessed an attack on a flock of Domestic Pigeons by one of these birds. The pigeons, panic stricken, took refuge in houses or in fact anywhere they could secure shelter, while the falcon with lightning speed scoured the village.

A pair of these birds were seen at Cape Cleveland repeatedly and a female shot at Red Cliff House on September 24, 1891, measured L. 23 in. Ex. 51.75 in.

26. **Nyctea nyctea.** SNOWY OWL. Eskimo, *Opik-So-ak.*—The only individual seen was in Tucktoo Valley on September 19, 1891. At a distance it appeared snowy white, sitting sphinx-like on the top of a small fragment of a stranded berg. At first I thought I was looking at a strange bit of ice sculpture. The bird would not permit of near approach and flew into the valley, always alighting on a rock. After a "wild goose chase" of upwards of a mile, I had only the satisfaction of seeing it disappear in the distance.

The Eskimo suffix, "so-ak," meaning big, suggests the possibility that yet another owl is known to them—probably the Short-eared Owl. (See Hagerup's 'Birds of Greenland,' Little Brown & Co. 1891.)

27. **Corvus corax principalis.** NORTHERN RAVEN. Eskimo, *Toodla-wah.*—A pair of these birds had a nest in an inaccessible niche, in the face of the brown trap rocky bluff which formed the northern boundary of the Glacier, at the head of McCormick Bay. The nest was probably five hundred feet above the sea, and little could be seen of it from our view point. I am fully satisfied that these birds do not all migrate in the fall because, after the sun had disappeared for the winter, we heard their hoarse croaking and five days before the sun reappeared, February 7, 1892, I saw in the dim twilight on the beach near our house a Raven lazily flopping along.

The old birds were extremely shy and difficult to approach, while it was quite the contrary with the young—they were trusting and inquisitive. At our boat camp in August, 1891, on Hakluyt Island, some young birds alighting on the flat shelving rocks on which we were cooking our evening meal, literally walked into camp, and at distances of no more than fifteen feet, ate the entrails of Guillemots that we tossed to them. We found them playful and at the expense of "Jack," a Newfoundland dog, amused themselves by leading him a chase. The birds would allow "Jack" to approach within a few feet and then with a flop or a hop, would keep just out of his reach.

I noticed the same peculiarity of flight in the Northern Raven, that I had previously observed in the Raven inhabiting the Colorado Cañon in Arizona. The birds, when flying at considerable elevation and desiring to descend, would turn sidewise in the air, and drop in that position—frequently one hundred feet or more—before lighting. In the fall, I saw them in flocks numbering as high as thirty or forty birds.

The Ravens are omnivorous feeders. They are fond of such sea foods as they can gather, although they will eat seeds and berries when they can get them. One stomach examined was proof conclusive that they will not hesitate to take a Little Auk fledgling when they need it and they will attack the carcass of a Reindeer if left unprotected and, in a remarkably short time, inflict such damage to the skin, as to render it unfit for use. They will attack the carcass at the vent, but the real "piece de resistance" is the mangled, half digested salad with which the paunch is generally well filled.

In the summer time the Raven's glossy black plumage stands conspicuously opposed to the general theory of protective coloration, but, who will gainsay the complete appropriateness of a black Raven seeking the seclusion of the long arctic night?

28. **Acanthis hornemanni hornemanni.** GREENLAND REDPOLL?—Identification uncertain. A brood of young birds seen in Five Glacier Valley on August 12, 1892. Although able to fly, they were accompanied by parent birds, and I did not have the heart to shoot.

29. **Plectrophenax nivalis nivalis.** SNOW BUNTING. Eskimo, *Koop-a-new.*—By far the most common of the land birds. First heard at Red Cliff House May 1, 1892, and how that cheerful, flute-like song cheered us. It heralded Spring, and we all rushed out to hear it.

The parent birds conceal the nests for protection under shelving rocks and as they flush easily, the nests are readily found. All nests taken in South Greenland on our way north and at our headquarters in 1891, were built of grass neatly lined with Ptarmigan feathers; whereas, the nests taken within half a mile of Red Cliff House in the summer of 1892, were invariably lined with Reindeer hair shed from our clothing; showing that some birds do not always use what they prefer for building material but, from necessity, use what they can get.

When an Eskimo finds a nest he selects and plucks a long hair from his head and with dexterous fingers fashions a running noose, which is placed over the entrance to the nest, the other end fastened to some small growing plant or even a blade of grass. This fiendish device seldom fails to accomplish its cruel purpose, and shortly after will be found, fluttering helplessly, the parent bird. When the Eskimo returns, true to his brutal nature, he ends the struggle by biting off the bird's head and stripping the feathers from the breast, eats with a relish the little tender body that still runs a temperature.

Several nests were taken between June 19 and July 22, 1892; five and six eggs being an average clutch—one nest contained seven eggs. Last seen in September, 1891.

Schenectady, N. Y.

ON SOME NEW AND RARE BIRDS FROM COREA.

BY NAGAMICHI KURODA, *Rigaskushi*, M. O. S. J., H. F. A. O. U.

AND

TAMEZO MORI, M. O. S. J.

Dryobates major seoulensis subsp. nov.

DIAGNOSIS.—Near to *D. major tscherskii*, from Sakhalien Island, but distinguished from it by the under-parts more or less washed with very pale buff and the throat nearly always tinged with brown; by the ear-coverts being always tinged with pale brown, and by the occurrence of a dark phase like that of *hondoensis*. From *D. major hondoensis* Kuroda, from Hondo, it differs in having the under-parts generally paler even in the pale phase; the upper mandible broader at the base—11–12 mm. instead of 9.5–11 mm.—and the height of both mandibles greater at the front of the nasal plumes—8.5 mm. instead of 7–8 mm. It also differs from *D. major japonicus* from Hokkaido, by the occurrence of a dark phase, by the upper mandible being broader at the base—10.5–11.5 mm. in *japonicus*—and both mandibles higher at the front of the nasal plumes,—7.5 mm. in *japonicus*.

The type specimen is from Koryo near Seoul, central Corea. Adult male, April 22, 1917, No. 2694, coll. N. Kuroda. It is a specimen in the pale phase of plumage.

HABITAT.—Apparently confined to the Corean Peninsula.

MEASUREMENTS.—3 ♂ ♂: wing, 129–131; tail, 81.5–84; tarsus, 21–21.5; outer anterior toe, 14.5–15; outer posterior toe, 15.5–17; inner anterior toe, 11.5–12.5; inner posterior toe, 7; culmen, 29–30.5; width of upper mandible at base, 11.5–12; height of both mandibles at the front of nasal plumes, 8.5 mm.

4 ♀ ♀: wing, 128.5–131; tail, 81.5–87; tarsus, 21–22; outer anterior toe, 14–15.5; outer posterior toe, 15–17; inner anterior toe, 12–13; inner posterior toe, 7; culmen, 27.5–30; width of upper mandible at base, 11–11.5; height of both mandibles at the front of nasal plumes, 8.5 mm.

TYPE: wing 130.5; tail, 81.5; tarsus, 21; outer anterior toe, 15; outer posterior toe, 17; inner anterior toe, 12.5; inner posterior toe, 7; culmen, 29; width of upper mandible at base, 12; height of both mandibles at the front of nasal plumes, 8.5 mm.

VARIATION.—A female obtained near Seoul, December 30, 1921, has four white spots on the outer web of the second primary. The fourth tail-feathers have no black bar on the webs and the

fifth or penultimate feathers have one black bar on the outer web and two on the inner web. It has, however, a wing measurement of 131 mm. only, not longer than the present form. We are inclined to think that these differences are due to rare individual variation.

The dark phase of the subspecies has the black barring on the tail feathers generally broader than in the pale phase of plumage.

Dryobates major brevirostris (Reichenbach).

We have examined one specimen from Seoul, Corea, December 30, 1921, and another from Port Arthur, So. Manchuria, September 1911. Both specimens are referable to the present form rather than to *kamtschaticus*.

The innermost secondaries of the two specimens have no large white spots on the apical portion of the webs. Moreover, they have a longer wing and much thicker and broader bill than in specimens of *tscherskii* and other forms of the *major*-group in Japan and Corea.

It is probably a winter visitor from northern Siberia to these places and is apparently a very interesting new addition to the avifauna of Corea and Manchuria.

MEASUREMENTS.—1 ♀ (Corea): wing, 138; tail, 92; tarsus, 22.5; outer anterior toe, 14; outer posterior toe, 15.5; inner anterior toe, 11.5; inner posterior toe, 7.5; culmen, 29; width of upper mandible at base, 12.5; height of both mandibles at the front of nasal plumes, 9.5 mm.

1 ♂ juv. (Port Arthur): wing 138; tail, 85; tarsus, 22.5; outer anterior toe, 15.5; outer posterior toe, 16.5; inner anterior toe, 12; inner posterior toe, 6.5; culmen, 28; width of upper mandible at base, 12; height of both mandibles at the front of nasal plumes, 9.5 mm.

Tetrastes bonasia coreensis, subsp. nov.

DIAGNOSIS.—♂ ad. Very similar to *T. bonasia amurensis* Riley, from Kirin Province, Manchuria, but distinguishable from it by the white margins of the chest-feathers being nearly uniformly tinged with gray-rufous and forming a chest-band and the blackish bands finer. In *amurensis*, the rufous tinge is confined to the lower fore-neck only. The crown

of the head and hind-neck are more ashy in tinge and without the distinct rufous color which exists in *amurensis*. It differs from *T. bonasia vicinatas* Riley from Hokkaido, Japan, by the head and hind-neck being more ashy instead of deeper rufous, by the bands on mantle being distinctly black instead of brownish, by the white margins of the chest-feathers being distinctly suffused with gray-rufous, and by the black bands on the tail-feathers being broader.

The female differs from that of *vicinitas*, by the chest being decidedly rufous, by the black spots of the feathers on the crown more extended, by the hind-neck and mantle being rufous with very broad black bands and the margin of the feathers grayish, by the central tail-feathers being darker and the bars black instead of brown, and by the much stouter bill.

We have no example of the female of *amurensis* for comparison with those of *vicinitas* and *coreensis*.

The type specimen is from Kogen Distr., Corea. Adult male, January, 1921. It is preserved in the first Higher Common School in Seoul.

HABITAT.—Probably confined to the mountainous parts of Corea.

MEASUREMENTS.—4 ♂ ♂: wing, 159–169; tail, 117–136; tarsus, 36.5–39; culmen, 24–25.5; bill from nostril, 11–12; width of black band on the outer-most tail-feathers, 16–20 mm.

3 ♀ ♀: wing, 164–169; tail, 119–120; tarsus, 38–39; culmen, 23–23.5; bill from nostril, 11.5; width of black band on the outermost tail-feather, 17–18 mm.

TYPE.—wing, 168; tail, 136; tarsus, 36.5; culmen, 25.5 bill from nostril 12; width of black band on the outermost tail-feathers, 20 mm.

A male from Kogen District, Corea, November 3, 1914, has its chest nearly like that of *amurensis* from Kirin, Manchuria, but the crown and hind-neck more ashy than rufous, and the mantle very heavily barred with black. We are inclined to think that the difference is probably due to individual variation.

Fukoyoshi Cho, Akasaka, Tokyo, Japan.

RECENT NOTES FROM AN OLD COLLECTING GROUND IN NORTH-EASTERN ILLINOIS.

BY COLIN CAMPBELL SANDBORN.

Some years ago the late John Farwell Ferry in his paper on 'Ornithological Conditions in North-eastern Illinois, with some Notes on Winter Birds' (Auk, Vol. XXIV, No. 2) called attention to Beach as an old Illinois collecting ground, where such men as Robert Kennicott, Fred T. Jencks, E. W. Nelson, Thomas H. and Charles Douglas, and Henry K. Coale had collected, some of their records dating back to 1853.

After nearly seventy years, however, its value as a collecting ground is almost gone and in a few years more the Beach of yesterday will have passed forever. The proposal to add Beach to the Forest Preserve was voted down at a recent election. Factories are steadily creeping up from Waukegan on the south. And some specimens taken at Beach show the effects of their closer approach as they are soiled by smoke and soot. The pines are being cut down for Christmas trees or to be used as blinds by duck hunters and fires have killed many of them and most of the junipers.

Mr Ferry gave a complete history and description of this region which I shall not repeat, but shall give a general idea of the country which will make references easy to follow. Beach lies forty miles north of Chicago in Lake County in the extreme north-eastern corner of the State, and stretches seven miles due north of Waukegan, a growing manufacturing town. It averages about a mile in width, with Lake Michigan on one side, and a high bluff, which is characteristic of the region north of Chicago, on the other. Along the lake stretch low sand ridges, and west of these is a large swamp, the open water of which is locally known as Dead Lake. This swamp drains into Lake Michigan through Dead River on the north and Little Dead River, which has now been dredged out to form a large harbor, on the south. South of Dead River the sand ridges are covered with rows of pines, and north, next the lake, with low juniper bushes, which on the west merge into thick oak scrub.

Beach has no deep hollows for a protection from the wind and no great food supply, so winter birds seem to make it just a temporary stopping place before passing to the Sand Dunes of Indiana about ninety miles south. It is only by chance then that they are found there and, although I have been very fortunate in this respect, there were many trips upon which, I have seen only a few Tree Sparrows and Crows. Inasmuch as this is the only wild bit of lake shore in northeastern Illinois it affords a natural feeding ground for many of the shorebirds.

During the past seven years that I have been collecting at Beach, I have made a number of records which I wish to add to the already long list from that locality. Some of these have already been reported in 'The Auk,' but as I have enlarged upon them, I take the liberty of repeating them. I wish to thank the members of the Chicago Ornithological Society for their cooperation in assisting me with certain of these records.

1. **Nycticorax n. naevius.** BLACK-CROWNED NIGHT HERON.—On January 4, 1921, Mr. Henry Kern, the local game warden, arrested a hunter who had just shot an immature bird of this speices. The specimen later came into the possession of Dr. C. W. G. Eifrig who reported the record.

2. **Tryngites subruficollis.** BUFF-BREASTED SANDPIPER.—October 2, 1921, I was attracted by the very long wings of a shorebird as it alighted a short distance down the beach. It proved to be a female of this species which is now in Mr. Coale's collection. Mr. Benjamin T. Gault and George P. Lewis reported two birds seen a number of times at the Lincoln Park beach in Chicago, early in September. As far as I can find, these are the first published records since 1898. (William A. Bryan, Auk, Vol. XVI.)

3. **Squatarola squatarola.** BLACK-BELLIED PLOVER.—Mr. George Stagg and I secured a pair of these birds October 7, 1920. They were in immature plumage and easily approached. This year (1921) I found a flock of twelve on the beach all through September and part of October. These were mostly immatures with three or four adults which kept a sharp watch and made it difficult to get within gun range. It is now rather a rare migrant here.

4. **Charadrius melodus.** PIPING PLOVER.—These birds first came to my notice on May 31, 1920, when I spent some time watching two pair, but my efforts to find a nest were unsuccessful. On June 5, I brought Mr. Edward R. Ford with me, who succeeded in locating a nest with four eggs

just hatching. Another pair, Mr. Ford decided, had probably had their first nest destroyed and would, no doubt nest again, so on June 12, I made a further search and was rewarded by flushing the bird from two eggs and on the 17th, collected the full complement of four. This is another species that was once common but is now rather rare. No birds were seen this year (1921).

5. **Falco c. columbarius.** PIGEON HAWK.—While hunting with Mr. George Stagg on October 12, 1920, he shot a male of this species on the wing; another was taken by Mr. Stephen S. Gregory on October 16, 1921. Most of the old writers give this bird as a common migrant but after talking to a number of collectors who have been very active in this region during the past ten years, I am convinced from their records that this species is now an uncommon migrant. Mr. Stagg also shot a Sharp-shinned Hawk the same day, a species which is a little more common than the former.

November 2, 1920, two friends of mine, Mr. Lyman Barr and Mr. George Stagg, reported an interesting observation to me. They were sitting on the beach when they saw a large hawk flying over the lake, where there were many flocks of ducks. The hawk suddenly swooped at the ducks which sent a shower of water into the air with their wings and drove him away. He tried flock after flock but each time met with the same defense and finally disappeared from sight. I have no doubt that this was a Duck Hawk but as I cannot definitely report it as such, thought that I would relate the incident and let the readers make their own identification.

6. **Picoides arcticus.** ARCTIC THREE-TOED WOODPECKER.—During the fall of 1920 the Chicago area was visited by a flight of this species, about sixteen being reported at different times. Previously there were only three records, to my knowledge, for the State, viz: one taken in Chicago by Dr. J. W. Velie in 1876; another later at Philo, Illinois, by Isaac E. Hess; and the third seen by Eliot Blackwelder at Morgan Park in 1894. The recent records are:

October 7, while at Beach, Mr. Stagg called my attention to a woodpecker which, when taken, proved to be a female Three-toed.

October 31, Mr. Karl W. Kahman, a taxidermist of Chicago, came into possession of a female which had been shot by a boy west of Evanston.

November 20, I saw a female on one of the main streets of Evanston and later heard of one being seen near there, probably the same bird.

November 26, Mr. Edward R. Ford observed a female on a busy street on the north-west side of the city.

Mr. H. L. Stoddard has already reported a number from the Sand Dunes in Indiana (Auk, Vol. XXXIV, No. 4 and Vol. XXXVIII, No. 1) to which I wish to add another taken by him November 21, 1920, and three reported by Dr. C. W. G. Eifrig, November 26. Five others were also

reported from the Dune country during October and November. All birds reported from Illinois were females while those from Indiana, with two exceptions, were males.

7. **Colaptes auratus luteus.** NORTHERN FLICKER.—One seen February 6, 1921. I have seen this bird in the Sand Dunes in Indiana in February but this is my first winter record for Illinois.

8. **Agelaius p. phoeniceus.** RED-WINGED BLACKBIRD.—An abundant summer resident but I was surprised to find one on December 17, 1917. It was shot by Mr. Stoddard and proved to be a male in good condition.

9. **Sturnella magna.** MEADOWLARK.—February 13, 1921, one seen near Dead Lake. A number of others were reported from different parts of the area due no doubt to the warm winter. I have questioned the species as three forms occur here, *magna* and *m. argutula* being about equally abundant and *neglecta* occasionally reported.

10. **Loxia curvirostra percna.** NEWFOUNDLAND CROSSBILL.—I first met with these birds on October 29, 1916, a cold, disagreable day, with a strong north wind and occasional flurries of rain and snow,. I did not expect to see much of interest on such a day but arriving at Beach I found large flocks of birds in the pines, which I soon identified through my glasses, as Crossbills. Due to the wind and the wildness of the birds, it was late in the afternoon before any were taken. Then I found three in the top of a pine and shot one. To my surprise the others did not leave so I took them both. This behavior proved to be typical from my experience with them later. When in large flocks they are wild or restless and hard to approach but when only two or three are together they can almost be caught by hand.

Mr. Coale and I had noticed the difference between these birds and *minor*, so with Mr. Stoddard we again visited Beach, November 5, and found the Crossbills still plentiful. They were feeding quietly in the pines and were not easy to see. One White-winged Crossbill seen among them is my only record for 1916. On subsequent trips, on November 19 and 26, and December 3, we found *percna* in large flocks; December 17, none were seen. The last record was January 11, 1917, when Mr. John Douglas sent one to Mr. Coale in the flesh.

During the next two years I was in the army so Mr. Coale kindly took up the work of identifying the Crossbills. He writes as follows:

"I am glad to be able to identify the large Crossbills we took at Beach, Illinois, October 1916 to January 1917, as the Newfoundland Crossbill, *Loxia curvirostra percna*, described by Mr. Bent in 1912. (Smithsonian Misc. Coll., Vol. 60, No. 15.)

"A number of specimens of *Loxia* from Illinois, Wyoming and Europe were sent with some of the new form to ornithologists for comparison. I quote from some of their letters:

"Mr. Robert Ridgway: 'You can safely label your specimens *Loxia curvirostra percna*, and the Wyoming birds *Loxia curvirostra bendirei*.'

"Dr. Witmer Stone: (who at the time had no others of the new race for comparison), 'I have no doubt that those obtained in 1916 in Illinois, are *Loxia c. percna*, the two little ones are of course *minor*, the Wyoming birds *bendirei*, and the European specimens true *curvirostra*.'

"Mr. J. H. Riley: 'I have shown your Crossbills to Mr. Oberholser, who is of the opinion that the large Illinois birds are *Loxia c. percna* Bent.'

"Mr. Bent: 'The box of Crossbills is very interesting. I have not had time to examine them critically, but off hand I should say that the two birds so marked are undoubtedly '*percna*.'

"In January, 1921 I had the pleasure of visiting several of the large eastern museums, and further confirmed the fact already established, that the large Illinois birds are *percna*."

Measurements given below were taken from fresh specimens before skinning (all collected at Beach):

H. K. C. No.	*Loxia c. minor.*		Average
22630 F. Nov. 30, 1919.	Length 5.6 in.	Extent 9.7 in.	2 females
10774 F. Nov. 9, 1906.	Length 6. in.	Extent 10.75 in.	L. 5.8
10772 M. Nov. 9, 1906.	Length 6 in.	Extent 10.50 in.	Ex. 10.23
			2 males
22629 M. Nov. 30, 1919.	Length 5.75in.	Extent 9.75 in.	L. 5.87
			Ex. 10.13
	Loxia c. percna.		Average
20452 M. Oct. 29, 1916	Length 7 in.	Extent 11.25 in.	3 males
20489 M. Dec. 3, 1916	Length 6.5 in.	Extent 11.10 in.	L. 6.83
20610 M. Jan. 11, 1917	Length 7. in.	Extent 10.20 in.	Ex. 11.18
			2 females
20484 F. Nov. 26, 1916	Length 6.5 in.	Extent 11.30 in.	L. 6.66
20153 F. Oct. 29, 1916	Length 6.82 in.	Extent 11.20 in.	Ex. 11.25

A number of other specimens of *percna* taken from the same flock are in the collections of the Field Museum (in the Harris Extension Coll.) and of Mr. E. E. Armstrong of Chicago.

11. **Acanthis l. linaria.** REDPOLL.—This winter (1920–21) is the first year for some time that I have not seen Redpolls. They were formerly here from early fall to late spring.

12. **Spinus pinus.** PINE SISKIN.—December 26, 1915, I found large flocks feeding in the weed patches. Have not seen many since although they have been reported commonly from the Dunes.

13. **Plectrophenax n. nivalis.** SNOW BUNTING.—Very common during the fall of 1916, from October to January; not many seen again until 1920, when they were here once more in large numbers.

14. **Spizella p. passerina.** CHIPPING SPARROW.—This was a very common bird about Chicago before the English Sparrow was introduced;

now it is only locally common. Beach is one place where it still holds its own. They first came to my notice on June 12, 1915, when with Mr. W. A. Goelitz we found three nests, one with large young, and two with fresh eggs. Another nest was found June 5, 1920. Mr. Coale has taken only one specimen near Highland Park.

15. **Junco hyemalis connectens.** SHUFELDT'S JUNCO.—One taken March 19, 1916 from a flock of *hyemalis*. There are only two other records for the State that I know of. February 20, 1887, Mr. H. K. Coale took a male at Waukegan (Auk, Vol. IV, page 330) and on December 16, 1892, Mr. William E. Praeger took one on the Illinois shore opposite Keokuk, Iowa, no sex given. (Auk, Vol. XII, No. 1).

16. **Melospiza l. lincolni.** LINCOLN'S SPARROW.—A specimen collected by Mr. Stephen S. Gregory, December 26, 1920. It is a fairly common migrant but I know of no other winter record

17. **Lanius borealis.** NORTHERN SHRIKE.—Mr. Stephen S. Gregory reported one of these birds December 26, 1920. Another was caught at Waukegan by Mr. W. I. Lyons who has been doing extensive trapping and banding work. The Shrike entered the trap after a Junco which it killed. It is a rare winter resident.

18. **Bombycilla garrula.** BOHEMIAN WAXWING.—There was a large flight of Waxwings during the winter of 1919–20. (Auk, Vol. XXXVII, No. 2.) Mr. H. L. Stoddard and I were in the pines the day many of them arrived, November 30, from six-thirty until noon, during which time flocks of fifty to one hundred passed steadily every five or ten minutes. There was a high wind and the birds were very restless swirling about like snowflakes, dropping down near a dead tree as if to alight, and then swinging up and away to the south. A flock stopped now and then to feed but for the most part the birds were migrating, following the edge of the Lake, for none were seen more than a quarter of a mile from the beach. Once about seventy-five birds lit on the frozen surface of Dead River, making a picture I shall long remember, but it was for only a minute as the last ones had hardly alighted when the first were up and away. We estimated that about fifteen hundred of the birds passed that day.

December 3, I found only one stray Waxwing, but on December 31, there were two large flocks present, about one hundred and fifty birds. This was the last time they were seen at Beach but were found throughout the winter in the Sand Dunes.

19. **Dendroica vigorsi.** PINE WARBLER.—These Warblers used to breed at Beach a good many years ago, but at present are rare even as migrants. My only record is a male taken May 7, 1921.

20. **Lanivireo s. solitarius.** BLUE-HEADED VIREO.—One taken November 5, 1916, a very late record for this region.

21. **Baeolophus bicolor.** TUFTED TITMOUSE. —Mr. Coale took one November 5, 1916. There are a few seen every year and one record of a

pair breeding at Lake Forest. They seem, like the Cardinal, to be gradually extending their range to the north.

22. **Sitta canadensis.** RED-BREASTED NUTHATCH.—Very common during the falls of 1915, 1916 and 1921. Other years only a few have been seen.

23. **Polioptila c. caerulea.** BLUE-GRAY GNATCATCHER.—Some years a very common migrant during May. A male was taken May 31, 1920 in the oak scrub and later the same day and throughout June a female was seen in the pines, generally in the same place and always uttering a plaintive call. I spent a great deal of time watching her on different occasions but if there was a nest it was never found. Dr. Eifrig reported seeing several May 30, 1921, and I intended making a search for a nest but my trip was delayed until July 24. On this date, I had just started through the oak scrub when I heard the call of the Gnatcatcher and found five in a small oak, two adults and three young. The young were almost fully grown and were catching insects for themselves but I saw the parents feed them a number of times. When the old birds approached the young opened their mouths and quivered their wings. This is a rare breeder in northeastern Illinois but is more common in the Sand Dunes in Indiana.

24. **Hylocichla g. guttata.** ALASKA HERMIT THRUSH. Mr. Coale took this bird November 5, 1916, and has already reported it in 'The Auk' (Vol. XXXIV, No. 1) being the first record east of the Rockies.

25. **Planesticus m. migratorius.**—ROBIN. Robins sometimes spend the winter in this region; seen December 31, 1914 and February 18, 1917.

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THE ROLE OF THE "ACCIDENTAL."*

BY JOSEPH GRINNELL.

The total number of species and subspecies of birds recorded upon definite basis from California amounts at the present moment to 576. Examination of the status of each species, and classification of the whole list according to frequency of observation, show that in 32 cases out of the 576 there is but one occurrence known. In 10 cases the presence of the species has been ascertained twice, in 6 cases three times, and for all the rest there are 4 or more

*Contribution from the Museum of Vertebrate Zoology of the University of California.

records of occurrence. Some 500 species can be called regularly migrant or resident.

Examination of the records for the past 35 years shows that the proportion of one-occurrence cases is continually increasing. In other words, the state is so well known ornithologically that regular migrants and residents have all or nearly all of them been discovered, and *their* number now remains practically constant, while more and more non-regulars are coming to notice. This might be explained on the ground that there are continually more and better-trained observers on the lookout for unusual birds. This is probably correct, partially. But also, I believe, there is indicated a continual appearance, within the confines of the state, through time, of additional species of extra-limital source.

In published bird lists generally, species which have been entered upon the basis of one occurrence only, are called "accidentals." This is true of county lists, of state lists, and, quite patently, of the American Ornithologists' Union's 'Check-list of North American Birds'. The idea in the adoption of the word "accidental" seems to have been that such an occurrence is wholly fortuitous, due to some unnatural agency (unnatural as regards the behavior of the bird itself) such as a storm of extraordinary violence, and that it is not likely to be repeated. This understanding of the word "accidental" is borne out by the explicit meaning given it in the 'Century Dictionary,' for instance, which is "taking place not according to the usual course of things," "happening by chance or accident, or unexpectedly." Now the way in which the word is used by ornithologists is really a misapplication of the term; for, as I propose to show, the occurrence of individual birds a greater or less distance beyond the bounds of the plentiful existence of the species to which they belong is the *regular thing, to be expected.* There is nothing really "accidental" about it; the process is part of the ordinary evolutionary program.

However, as I have intimated, the word is firmly fixed in distributional literature. We had better continue to use it; but let us do so with the understanding that it simply means that any species so designated has occurred in the locality specified on but one known occasion. No special significance need to be implied.

Accidentals are recruited mostly from those kinds of birds which are strong fliers. It is true that the majority belong to species of distinctly migratory habit. But some of our accidentals exemplify the most sedentary of species. Examples of one-instance occurrences, in other words "accidentals," are as follows: the Western Tanager in Wisconsin, the Louisiana Water-Thrush in southern California, Townsend's Solitaire in New York, the Catbird on the Farallon Islands, the Tennessee Warbler in southern California, and Wilson's Petrel on Monterey Bay. In the North American list some of the accidentals come from South America, some even from Asia and from Europe.

I would like to emphasize the point now that there is no species on the entire North American list, of some 1250 entries, that is not just as likely to appear in California sooner or later as some of those which are known to *have* occurred. Expressing it in another way, it is only a matter of time theoretically until the list of California birds will be identical with that for North America as a whole. On the basis of the rate for the last 35 years, 1⅛ additions to the California list per year, this will happen in 410 years, namely in the year 2331, if the same intensity of observation now exercised be maintained. If observers become still more numerous and alert, the time will be shortened.

It will be observed that there are now many more one-occurrence, "accidental," cases than there are two-occurrence cases, and that there are more of the two-occurrence group than there are three-occurrence, and so forth, there being a regular reduction in the intervals so that, if we just had enough observations, a smooth curve would probably result. If the one-instance occurrences should continue to accumulate without any modification of the process, in the course of about 300 years there would be more of these "accidentals" in California than of regularly resident species, and the other groups would grade down in a steeper curve. I attempted to carry out the figures, which seem to behave according to some mathematical formula; but when I came to deal with ⅛ of an occurrence I decided it was profitless to go on!

It is evident, however, that another process takes place, of quite opposite effect. With the lapse of time second-occurrence

cases replace one-occurrence cases, to be followed by a third order of accretion, and this by a fourth; and the process might continue on ad infinitum, until theoretically, sometime after the full number of the North American list had been reached, our state list would no longer contain any accidentals at all. To cite an example, the eastern White-throated Sparrow was recorded first from California, and then as an accidental, on December 23, 1888; in 1889 a second specimen was taken; in 1891, a third was taken; and so on until in 1921, 19 occurrences have been recorded. This species is considered now simply as rare, certainly not accidental, casual, or even specially noteworthy save from a very local standpoint.

It comes to the mind here that if observations could be carried on so comprehensively as to bring scrutiny each year of every one of the 200,000,000 birds in California, this being the estimated minimum population maintained within the state from year to year, a great many more accidentals would be detected than are now known, and in addition some birds now known from but a few records, or even as accidentals, would come to be considered of frequent, though not necessarily regular, occurrence. With the White-throated Sparrow it is not impossible that a thousand of the birds have wintered in California in certain years.

Some of the considerations in the preceding paragraphs, while of interest in themselves perhaps, have confessedly been rather beside the issue. For the definite question which I wished to ask and which I will now briefly discuss is as to the function or role played by accidentals. Are they a mere by-product of species activity or do they in themselves constitute part of a mechanism of distinct use to the species?

The rate of reproduction in all birds, as with other animals, is so great that the population rapidly tends toward serious congestion except as relieved by death of individuals from various causes or else by expansion of the area occupied. The individuals making up a given bird species and occupying a restricted habitat may be likened to the molecules of a gas in a container which are continually beating against one another and against the confining walls, with resulting pressure outwards. But there is an essential difference in the case of the bird in that the number of individual

units is being augmented 50 per cent, 100 per cent, in some cases even 500 per cent, at each annual period of reproduction, with correspondingly reinforced outward pressure.

The force of impingement of the species against the barriers which operate to hem it in geographically, results in the more than normally rapid death of those individuals which find themselves under frontier conditions. There follows, through time and space both, a continual flow of the units of population from the center or centers toward the frontiers.

The common barriers which delimit bird distribution are as follows: Land to aquatic species and bodies or streams of water to terrestrial species, the climatic barriers of temperature, up or down beyond the limits to which the species may be accustomed, and of atmospheric humidity beyond critical limits of percentage; the limits of occurrence of food as regards amount and kind with respect to the inherent food-getting and food-using equipment of the species concerned; and the limits of occurrence of breeding places and safety refuges of a kind prescribed by the structural characters of the species requiring them.

An enormous death rate results from the process of trial and error where individuals are exposed wholesale to adverse conditions. This can be no less, on an average, than the annual rate of increase, if we grant that populations are, on an average, maintaining their numbers from year to year in statu quo. But before the individuals within the metropolis of a species succumb directly or indirectly to the results of severe competition, or those at the periphery succumb to the extreme vicissitudes of unfavorable conditions of climate, food or whatnot obtaining there, the latter have served the species invaluably in *testing out* the adjoining areas for possibly new territory to occupy. These *pioneers* are of exceeding importance to the species in that they are continually being centrifuged off on scouting expeditions (to mix the metaphor), to seek new country which may prove fit for occupancy. The vast majority of such individuals, 99 out of every hundred perhaps, are foredoomed to early destruction without any opportunity of breeding. Some few individuals may get back to the metropolis of the species. In the relatively rare case two birds comprising a pair, of greater

hardihood, possibly, than the average, will find themselves a little beyond the confines of the metropolis of the species, where they will rear a brood successfully and thus establish a new outpost. Or, having gone farther yet, such a pair may even stumble upon a combination of conditions in a new locality the same as in its parent metropolis, and there start a new detached colony of the species.

It is this rare instance of success that goes to justify the prodigal expenditure of individuals by the species. Such instances, repeated, result in the gradual extension of habitat limits on the part especially of species in which the frontier populations are in some degree adaptable—in which they can acquire modifications which make them fit for still farther peripheral invasion against forbidding conditions.

Incidentally, the great majority of these pioneers are, I believe, birds-of-the-year, in the first full vigor of maturity; such birds are innately prone to wander; and furthermore it is the autumnal season when the movement is most in evidence, a period of food-lessening when competitive pressure is being brought to bear upon the congested populations within their normal habitats. The impetus to go forth is derived from several sources.

The "accidentals" are the exceptional individuals that go farthest away from the metropolis of the species; they do not belong to the ordinary mob that surges against the barrier, but are among those individuals that cross through or over the barrier, by reason of extraordinary complement of energy, in part by reason of hardihood with respect to the particular factors comprising the barrier, and in part of course, sometimes, through merely fortuitous circumstances of a favoring sort.

Geologists tell us that barriers of climate are continually moving about over the earth's surface, due to uplift and depression, changes in atmospheric currents, and a variety of other causes. Animal populations are by them being herded about, as it were, though that is too weak a word. The encroaching barrier on the one side impinges against the population on that side; the strain may be relieved on the opposite side, *if* the barrier on that side undergoes parallel shifting, with the result that the species

as a whole may, through time, flow in a set direction. If anything should happen that a barrier on one side impinged on a species without corresponding retreat of the barrier on the other side, the habitat of the species would be reduced like the space between the jaws of a pair of pliers, and finally disappear: the species would be extinct.

But, in the case of persistence, it is the rule for the population, by means of those individuals and descent lines on the periphery of the metropolis of the species, to keep up with the receding barrier and not only that but to press the advance. I might picture the behavior of the population of a given bird as like the behavior of an active amoeba. This classic animal advances by means of outpushings here and there in reaction to the environment or along lines of least resistance. The whole mass advances as well. The particles of protoplasm comprising the amoeba may be likened to the individuals comprising the entire population of the animal in question, the mass of the amoeba to the aggregate of the population.

It is obvious that the interests of the individual are sacrificed in the interests of the species. The species will not succeed in maintaining itself except by virtue of the continual activity of pioneers, the function of which is to seek out new places for establishment. Only by the service of the scouts is the army as a whole able to advance or to prevent itself being engulfed: in the vernacular, crowded off the map—its career ended.

The same general ideas that I have set forth with regard to birds, who happen to be endowed with means of easy locomotion, hold, I believe, also for mammals, and probably in greater or less degree for most other animals. I can conceive of a snail in the role of an "accidental," an individual which has wandered a few feet or a few rods beyond the usual confines of the habitat of its species. Given the element of time (and geologists are granting this element in greater and greater measure of late), the same processes will hold for the slower moving creatures as they seem to do for those gifted with extreme mobility.

Migration, by the way, looks to me to be just a phase of distribution, wherein more or less regular seasonal shifting of popula-

tions takes place in response to precisely the same factors as hem in the ranges of sedentary species.

The continual wide dissemination of so-called accidentals, has, then, provided the mechanism by which each species as a whole spreads, or by which it travels from place to place when this is necessitated by shifting barriers. They constitute sort of sensitive tentacles, by which the species keeps aware of the possibilities of areal expansion. In a world of changing conditions it is necessary that close touch be maintained between a species and its geographical limits, else it will be cut off directly from persistence, or a rival species, an associational analogue, will get there first, and the same fate overtake it through unsuccessful competition—supplantation.

Museum Vert. Zool., Univ. of California, Berkeley, Calif.
(*September 7, 1921.*)

NOTES ON FOOD HABITS OF THE SHOVELLER OR SPOONBILL DUCK (SPATULA CLYPEATA).

BY W. L. MCATEE.

Reports have been made by the Biological Survey upon the food habits of all of the shoal-water ducks of the United States except the Shoveller. McAtee wrote the accounts[1] of the Mallard, Black Duck and Southern Black Duck, and Mabbott those[2] of the Gadwall, Baldpate, European Widgeon, Green-winged, Blue-winged and Cinnamon Teals, Pintail and Wood Duck. The Shoveller would have been included in the latter report had the author returned from war. However, design as well as fate had to do with the omission; truth is that the food habits of the Spoonbill duck are more difficult to study than those of any other anatine species yet investigated and the work, therefore, was postponed to the last. Even so the pioneer analyses by McAtee have not yet been supplemented and these are here reported upon so that some data on the food habits of the Shoveller will be available, and the

[1] U. S. Dept. Agr. Bull. 720, 35 pp., 1 Pl. Dec. 1918.
[2] U. S. Dept. Agr. Bul. 862, 67 pp., 7 pls. Dec. 1920.

dietetic reports upon a major group of our wild ducks made measurably complete.

Popularly the Spoonbill is reputed to feed upon mud and three of the local names of the bird emphasize this belief, namely, "mud duck," "mud lark," and "mud shoveller." With respect to mud, the pure thing itself, can scarcely be considered as nutritious, but the material referred to in common parlance as the pabulum of mud-eaters, is bottom ooze composed largely of more or less decayed vegetable debris often containing large numbers of minute plants and animals such as diatoms and ostracods. There is little doubt that these small organisms supply most of the nutriment in the so-called mud found in alimentary tracts of shovellers. The broadening of the bill of this bird, the multiplication of the straining lamellae and elongation of the intestine, all are specializations for nutritive utilization of minute organisms, and while the Spoonbill takes more of this kind of food than other ducks, it does not habitually profit by its specializations, as only about 15, certainly not to exceed 20 per cent of the birds examined had fed on bottom ooze.

For the present study of the food habits of the species, gizzards (some with crops) of 84 Shovellers have been examined. These were collected in 12 states with Texas most heavily represented by 25, but with 5 or more each from Colorado, California, Arkansas, Louisiana, South Carolina, and Florida. They were collected in all months from August to April inclusive, the largest numbers being taken in November and February. Fourteen of the total number of stomach contents analyzed were rejected, because of insufficiencies of various kinds, thus leaving 70 upon which the percentages of food items here cited are based.

Tabulating the food items of these 70 Spoonbills in the simplest way, (i. e. without attempting to eliminate errors due to inequalities in geographic and seasonal distribution of the specimens) we find that 65.76% of the total food is of vegetable and 34.24% of animal origin. This is a higher proportion of animal food than taken by any of the other shoal water ducks with the sole exception of the Southern Black Duck, a species living where animal food is plentifully available all the year.

The largest item of animal food is molluscs, practically all of them fresh-water univalves. They constituted 18.97% of the total or more than half of the animal food of the Shoveller. No fewer than 280 *Physa heterostropha* were counted in one stomach contents and 1100 *Amnicola floridana* in another. Unidentified snails were found in 29 of the 84 stomachs examined and the following identified kinds in the number stated in connection with each:

Amnicola floridana	2	Lymnaea sp	1
Amnicola limosa	1	Planorbis exacuous	1
Amnicola porata	1	Planorbis parvus	4
Amnicola sp	2	Planorbis trivolvis	1
Neritina reclivata	4	Physa heterostropha	2
		Physa sp	2

Aquatic insects are next in importance in the regimen of the Spoonbill Duck, water-bugs contributing 3.64% to the diet and water-beetles, caddis larvae, dragon-fly nymphs, and all other insects together about one per cent each. The water bugs were chiefly water boatmen (Corixidae) found in 9 stomachs. These small creatures swarm over the bottom ooze and play an important part in transforming nutriment gathered there into meat much sought by higher forms. Other water-bugs captured by the Spoonbill include back-swimmers (Notonectidae among them *Notonecta undulata*), one of the medium-sized species of "giant water-bugs" (*Zaitha*) and a water scorpion (*Ranatra*).

The water beetles eaten are chiefly small species, but include a few of the highly predaceous larvae known as water-tigers (Dytiscidae). A list of the water-beetles identified from Shoveller stomachs is:

Haliplus punctatus	1	Dytiscidae	3
Haliplus ruficollis	1	Berosus sp	3
Haliplus sp	1	Tropisternus sp	2
Bidessus pullus	1	Water-beetles (further unidentified)	4
Bidessus sp	1		
Hydroporus sp	1		

Caddis larvae and their cases and dragon-fly nymphs are most numerous among the other insects preyed upon, but there is nothing of special note regarding them, nor were any of them identified. The remaining insects included larvae of midges,

soldier-flies, horse-flies, may-flies, a hymenopteron, and a bird louse, of a species (*Lipeurus squalidus*) known to infest the Shoveller. Not insects but more closely allied to them than to other orders are the water-mites (Hydrachnidae) which were identified from 5 stomachs.

Remains of small fishes composed nearly 3 per cent of the food of the Shovellers examined; in one case 6 small carp (*Cyprinus carpio*) had been taken by a single bird. Crustaceans make up the balance of the animal food and although 2 crawfishes were among them the great bulk was made up of those minute bivalved forms known as Ostracods together with a few of the naked Copepods. In one instance hundreds of Ostracods had been consumed as part of one meal. In the case of a Shoveller collected at South Island, S. C., March 31, 1905, a male specimen of a new species of *Ilyodromus* was identified by Dr. R. W. Sharpe of New York, who stated that the genus had not previously been reported from North America and that no male had ever before been found. The names of the Ostracods identified and the number of stomachs in which found are:

Candona sigmoides	1	Cypris pellucida	2
Candona simpsoni	2	Cypridopsis vidua	1
Candona sp	3	Cythere sp	1
Cypria dentifera	2	Ilyodromus sp.	1
		Potamocypris smaragdina	1

Foraminifera were found in a single stomach from the Mississippi Delta, and oligochaete worms in two.

The approximate two-thirds of the diet of the Shoveller derived from the vegetable kingdom is drawn from numerous plant families none of which is of really preponderating importance. A fair share of the total course is composed of the macerated plant debris which is so important a constituent of the bottom ooze. Aside from this indeterminate material the leading items are: sedges, 16.02%; pondweeds, 11.25%; grasses, 8.28%; algae, 6.55%; waterlilies, 2.5%; duckweeds, 1.7%; and smartweeds, 1.1%. Chiefly the seeds of sedges are eaten, those most in favor being bulrush (*Scirpus*) and saw-grass (*Mariscus*). About 200 seeds of the latter plant were found in one stomach. The pondweeds consumed were mostly *Potamogeton* and widgeon grass (*Ruppia*)

of each of which more than 150 seeds were counted in single gizzards, but of another genus of this family, the horned pondweed (*Zannichellia*) more than 1600 seeds were taken by one bird at a meal. The grasses identified in the Shoveller's food were mostly switch-grasses (*Panicum*), and cultivated rice. However the seeds of the latter eaten were shattered grain gleaned in the fields in winter, and their consumption is a benefit since volunteer rice is very objectionable. About 300 seeds of a beach grass (*Monanthochlöe littoralis*) were found in one stomach. The algae determined were musk-grasses(*Chara*) but filamentous algae not identified are just as important a proportion of the food. Diatoms were detected in 2 stomachs. Seeds of water-lilies, largely those of water-shield (*Brasenia*) and stolons of the banana waterlily (*Castalia mexicana*) represent this family in the Shoveller's diet; duckweeds (*Lemnaceae*) are eaten entire, and seeds again of smartweeds are the portion sought. The only other item of plant food worthy of special note is the velvet duckweed (*Azolla caroliniana*), a fern ally growing on the water surface of southern swamps, specimens of which composed nearly half of the contents of one stomach; it seems to be rarely eaten by birds.

Items of vegetable food and number of stomachs in which found:

Diatoms	2	Foxtail grass (*Chaetochloa* sp.)	1
Musk-grass (*Chara* sp.)	3	Rice cut-grass (*Leersia oryzoides*)	1
Unidentified algae	7	Rice (*Oryza sativa*)	4
Velvet duckweed (*Azolla caroliniana*)	1	Beach grass (*Monanthochloe littoralis*)	2
Pepperwort (*Marsilea vestita*)	4	Unidentified grasses	5
Bur-reed (*Sparganium* sp.)	3	Nut-grass (*Cyperus* sp.)	3
Small pondweed (*Potamogeton pusillus*)	2	Spike-rush (*Eleocharis* sp.)	5
Sago pondweed (*Potamogeton pectinatus*)	2	Hair sedge (*Stenophyllus capillaris*)	1
Pondweeds (*Potamogeton* sp.)	13	*Fimbristylis* sp.	5
Bushy pondweed (*Naias flexilis*)	3	Bulrush (*Scirpus* sp.)	19
Horned pondweed (*Zannichellia palustris*)	1	Three-square (*Scirpus americanus*)	1
Widgeon grass (*Ruppia martima*)	12	River bulrush (*Scirpus fluviatilis*)	1
Wapato (*Sagittaria* sp.)	1	Bog-rush (*Mariscus mariscoides*)	1
Wild millet (*Echinochloa crus-galli*)	1	Saw-grass (*Mariscus jamaicensis*)	6
Switch grass (*Panicum* sp.)	6	*Carex* sp.	4
		Carex decomposita	1
		Unidentified sedges	11
		Small duckweed (*Lemna minor*)	1

Duckweed (*Lemna* sp.)	2	Banana water-lily (*Castalia mexicana*)	2
False nettle (*Boehmeria cylindrica*)	1	Waterlily (*Castalia* sp.)	1
Water smartweed (*Persicaria amphibia*)	5	Senna (*Cassia sp.*)	2
Prickly smartweed (*Tracaulon sagittatum*)	2	Poison ivy (*Rhus toxicodendron*)	1
Unidentified smartweed (*Polygonum* sp.)	6	Grape (*Vitis* sp.)	2
Pigweed (*Amaranthus* sp.)	1	Malvaceae	1
Lambs'-quarters (*Chenopodium* sp.)	1	*Malva* sp.	3
Glasswort (*Salicornia ambigua*)	1	*Hypericum* sp.	1
Sea purslane (*Sesuvium martimum*)	1	Water milfoil (*Myriophyllum* sp.)	3
Coontail (*Ceratophyllum demersum*)	6	Mermaid weed (*Proserpinaca* sp.)	2
Water-shield (*Brasenia schreberi*)	3	Dodder (*Cuscuta* sp.)	2
		Heliotropium indicum	15
		Cleavers (*Galium sp.*)	1
		Buttonbush (*Cephalanthus occidentalis*)	2

Notes from other authors.—Audubon[1] reports leeches as part of the food of the Shoveller; Aughey[2] found Rocky Mountain locusts (*Caloptenus spretus*) in a stomach he examined; Baker[3] reports the mollusk (*Rissonia pulchra*); Fisher[4] notes that: "At . . . Owens Lake, Calif., Mr. Nelson found it feeding extensively on the larvae and pupae of a small fly (*Ephydra hias*) which abounds in the lake," Lantz and Piper[5] observed it feeding greedily on maggots as they floated downstream from a dead cow; and Samuels[6] adds tadpoles to its bill of fare.

Summary.—So far as known, the Shoveller damages no crop, nor does it feed upon any animals of pronounced value to man. On the other hand it does devour various fish predators as dragonfly nymphs, giant water-bugs, water scorpions, water-tigers, back-swimmers, and crawfishes. The latter creatures are destructive also to crops and leaves. The food preferences of the species are such that it probably is not attracted by pure clean stands of the valuable duck food plants so much as by sheer density of vegetation with an accompanying abundance of animal life.

[1] Orn. Biogr. 4, 1838, p. 241.
[2] Rep. U. S. Ent. Comm. 1877, app. 2, p. 59.
[3] Proc. Ac. Sci. Phila., 1889, p. 267.
[4] N. A. Fauna 7, 1893, p. 17.
[5] Biol. Survey Field Notes.
[6] Orn. & Col. New England, 1868, p. 497.

The food habits of the species are of interest in that a larger number of minute organisms such as ostracods, copepods and diatoms, are taken, than by most ducks, a result, no doubt, of more thorough sifting of the bottom ooze.

U. S. Biological Survey, Washington, D. C.

THE SONG OF THE FIELD SPARROW.

BY ARETAS A. SAUNDERS.

THE song of the Field Sparrow (*Spizella pusilla*) is one which can be studied comparatively easily. The abundance of the species in most parts of its breeding range; the length of the song period; the freedom with which the species sings, the individual repeating its song at short intervals; the clearness of quality, which makes the pitch of the notes easily determined; and the shortness and general simplicity of the song, all are factors which help to bring this about.

The more one studies bird song, the more one attempts to make accurate records of songs, the more he becomes impressed with the fact that in almost all species there is great individual variation. Such variation is the rule, not the exception. Because of this it is difficult to make definite general statements concerning the character of the song of any species. Any such statement must be qualified by the fact that there are often individuals that sing a song entirely different in one or more respects from all others of that species.

The general characteristics of the song of the Field Sparrow, covering the five main factors of variation in bird song, are as follows.

1. Time. The Field Sparrow song is of short duration. The average length of the song, based on the one hundred and forty-nine records I now have, is 2.7 seconds. The longest song of all is 4.6 seconds, and the shortest 1.6 seconds. It is rare to find songs that are longer than 3.2 seconds or shorter than 2.4 seconds. One specific time character, that holds in practically all songs, is

acceleration. The introductory notes are the longest and the terminal notes the shortest of the song, the latter often so rapidly repeated that they cannot be counted and must be recorded as a trill. It seems to me that the trilled notes of Field Sparrow songs are of this character, rather than a trill produced by the repetition of a consonant sound. (Auk, XXXII, p. 174.)

II. Pitch. The pitch of a single song of the Field Sparrow never varies greatly. The amount of variation may be none at at all, or as much as four tones, but songs with a variation of more than two or two and a half tones are rare. The range of pitch for the species as shown by the same one hundred and forty-nine records is exactly one octave, from D'''' to D'''. The great majority of songs range between C'''' and F'''. The greatest range of any single song is four tones, from C'''' to E'''. The variation in pitch of most songs grades evenly up or down the scale. Sudden changes in pitch of more than two tones are rare. The greatest changes in pitch are to be found in slurred notes at the beginning of certain songs.

III. Quality. The quality of the Field Sparrow song is that of a clear sweet whistle. There is no variation in quality noticeable in different parts of the same song, and very little between the songs of different individuals. It is the sweetness of quality that makes the song of this bird so pleasing. In other respects the song is quite simple, and does not show characters that would class the bird among the best singers. I have only one record of a song that varied enough from the usual sweetness of quality to make note of the fact. This song, number 23 in the illustrations, was distinct from others in other respects as well as quality. The voice of the bird was about the quality of that of the Redstart, and was not recognizable as that of a Field Sparrow at all. This song, which I shall mention again, is a good example of the occasional freak song that may occur in any species.

IV. Intensity. The general intensity of the song of the Field Sparrow varies but little. As a rule with most bird music, the higher notes carry farther than the lower ones. There are no markedly accented notes in the song, that is, not accented as far as intensity is concerned. Accent seems, by some writers on bird

song, to be treated as a time factor, that is, notes of longer duration are considered accented. From this standpoint many notes in the Field Sparrow song are accented. But I prefer to consider accent entirely a matter of intensity, an accented note being louder than others, not longer. From this standpoint accent is very slight or unknown in Field Sparrow songs.

I have measured the intensity of only one or two songs. Song number 9 in the illustrations was completely audible from a distance of three hundred and forty feet, on a day when the wind was not blowing. The highest part, the high part of the long trill, was audible from three hundred and eighty feet, under the same conditions. This was on a level, with few trees or other obstructions between my position and that of the bird. Figuring that the intensity of sound varies inversely as the square of the distance from its source, this would make the intensity of the lower notes of this song practically four-fifths of that of the higher notes. Another song, number 2 in the illustrations, was audible from about two hundred and eighty feet, but conditions for determining this were not so good in this case, so that the measure is less reliable.

V. Pronunciation. The song of this species is usually without consonant sounds of any sort. In fact I have not certainly heard such sounds in any song. Certain songs, such as number 10 in the illustrations, having notes with a slight upward slur in them, sound from a distance as tho these notes were not variable in pitch, but were introduced by a sound like the consonant w. That is, the slight slur makes the notes sound like "wee wee wee" instead of "eee eee eee," as they would sound if not slurred.

Having considered the general song of the species as a whole, the next point to consider is variation. Variation may be individual, local, or geographical. My records of the song of this species which are made by the graphic method[1] are all from southern New York and Connecticut, and do not show any geographical variation, and only slight local variation. While I have heard the song in other states I have made no records for definite comparison. I

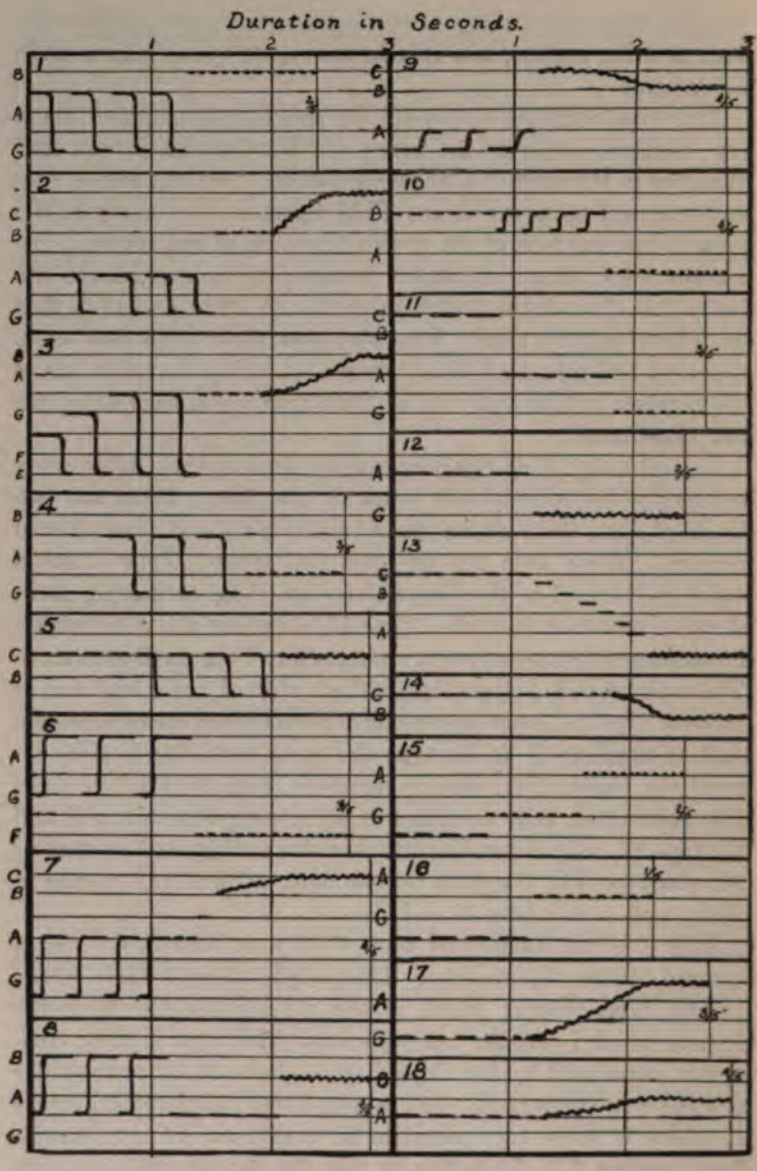
[1] 'Auk' XXXII, pp. 173 – 183.

have no notes or memory of any marked difference between the song in other regions, and that in the region where I have made my records.

Individual variation may be divided into two main kinds. These are variation between the songs of different individuals, and variation in the song of a single individual. The first sort is very common and apparent in the Field Sparrow. Its study is the most interesting part of the study of the song of this species. My records show great variation. Looking them over, there are many that show distinct relationship to each other, and a few that are almost exactly alike. I have divided these songs into seven types. I find that most of my records are easily classed in one of these types, in fact only two of those that are normal songs are not classifiable.

A good many Field Sparrow songs contain slurred notes, most commonly the introductory notes of the song. There are two kinds of slurs, those slurred downward in pitch and those slurred upward. These then are the first two types. Type I, songs numbered 1 to 5 in the illustrations, are those containing notes slurred downward in pitch. Type II, songs are those containing notes slurred upward in pitch, numbers 6 to 10 in the illustrations. The remaining five types are without slurred notes and are as follows: type III, songs descending in pitch toward the termination, such as numbers 11 to 14; type IV, songs ascending in pitch toward the termination, such as numbers 15 to 18; type V, songs first descending, then ascending in pitch, such as numbers 19 and 20; type VI, songs ascending and then descending, such as number 21; and type VII, songs all on one note, without any change in pitch, such as numbers 22 and 23.

Type I is the commonest type of song, at least in the region covered by my observations. Thirty-eight of my records belong to this type, making 26.2% of the one-hundred and forty-five records which I consider normal songs. This type is most commonly introduced by the slurred notes, followed by faster notes or a trill on a higher pitch. Such a song is well illustrated in number 1, which is fairly representative of twenty-one of my records. Song number 2 is distinctive in that the slurred notes are very

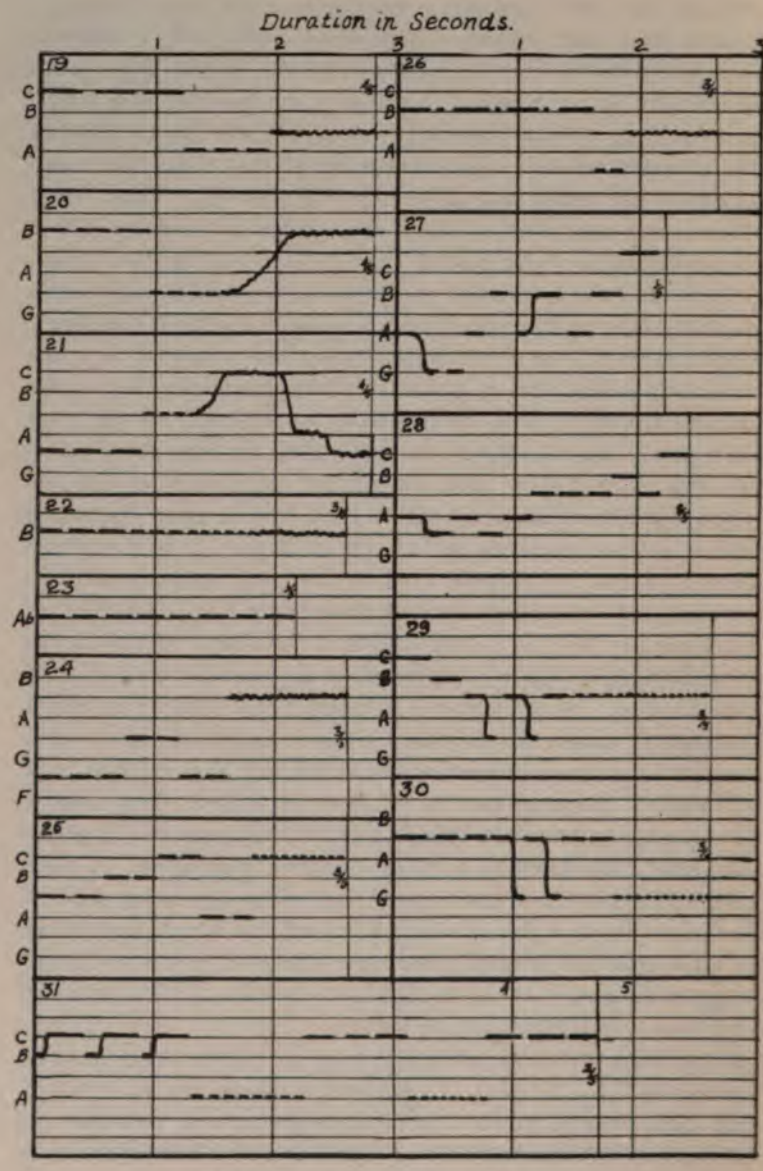


SONGS OF THE FIELD SPARROW.
TYPES I, II, III AND IV.

slow at first, and markedly accelerated as the song continues. I have three such records. Number 3 shows still a different variation, with the slurs ascending in pitch. I have three songs of this sort in my records. Number 4 is typical of four songs, introduced by a single long note, followed by the slurs. Number five is typical of four others where the slurred notes are in the middle of the song, instead of at the beginning. Three other songs of this type are essentially like number 1, but differ in that the termination is lower in pitch than the slurs, rather than higher.

Type II is also a common one, being represented in my records by thirty-one songs, or 21.4%. These songs are most commonly like numbers 6, 7 or 8 in form. Ten are like number 6 with the terminal portion lower in pitch than the introductory slurs. Six are like number 7, with the terminal trill higher. No less than thirteen are like number 8, the song divisible into three parts, first high pitched slurs, then low pitched single notes, then a terminal trill of medium pitch. This form of song is so distinctive that it might be classed as a separate type. It is commonly quite rhythmic in character, and in the great majority of cases the first and second parts are of three notes each. Dr. Winsor M. Tyler has sent me descriptions of several Field Sparrow songs from Lexington, Mass. One of these is obviously this form of type II song. Song number 9 is distinct and without a second counterpart among my records. While it might be classed with number 7, its great distinction lies in the fact that the first note of the slur is the longer one, rather, than the second. Song number 10 is also the only one of its kind I have recorded, but Dr. Tyler has sent me a description of a similar one from Lexington. A third song he has sent me is also type II, but unlike any in my records. It begins with four slurs, the second, third and fourth each lower in pitch than the preceding one; and ends with a series of rapid notes on the same pitch as the first slur. In a way it is the opposite of a type I song, such as number 3.

Type III is nearly as common as type II. I have thirty records, making 20.7%. Number 11 represents a descending song broken into three distinct parts. I have three such songs. Number 12, broken into two distinct parts, is common and I have seven such



SONGS OF THE FIELD SPARROW
TYPES V, VI AND VII, AND VARIABLE SONGS.

records. But the commonest of type III songs is represented in number 13, where the descent in pitch is gradual. I have fourteen such records. Number 14 is one with a change in pitch of only half a tone. I have six such records. They are interesting in that they grade toward the type VII song. In fact from a distance I have sometimes thought them type VII, and have always made a point not to record songs of such type unless I can hear them closely and distinctly. A recorder without a good musical ear would probably consider them type VII.

Type IV shows practically the same four variations as type III in exactly the reverse. I have twenty-six type IV songs, or 17.9%. Five are similar to number 15, seven to number 16, eleven to number 17, and three to number 18, a song with so slight a change in pitch that it shows intergradation between this type and type VII, and is easily mistaken for the latter. Song number 15 is in a way unusual. It is one of the most perfectly rhythmic Field Sparrow songs I have recorded, being in three parts exactly equal in time, according to the stop watch, and with four notes in the first part, eight in the second and twelve in the third.

Type V is rarer than the preceding types. I have only eight such songs making 5.5%. Five of these songs are similar to number 19 but the other three are rather irregular and more similar to number 20. The songs like number 19 show a strong relationship to type II songs such as number 8. In fact they are the same, save that the first notes are not slurred.

Type VI is a rare one. I rather hesitated about including it as a type, for the three songs I have are irregular and not much alike save in a general way. They are only 2.1% of the whole. Number 21 is an example, a unique song, but as representative as any of the type. The bird that sang this song occasionally dropped off the terminal trill, leaving nothing but a simple type IV song, so that possibly the evolution of such a song was from type IV.

Type VII is represented by seven records or 4.8%. I also have one record of this type from Mr. Tyler. Six of my seven records are like number 22, differing from each other only in pitch and in length. The seventh, number 23, is unique in two respects,

and to be regarded as a freak song. It shows none of the acceleration, which seems to be a general characteristic of Field Sparrow songs, and, as I have already mentioned, its quality was not that of the usual Field Sparrow song, so that when I first heard it I thought it some warbler with which I was not familiar, and was much surprised when I identified it. This bird was found in Norwalk in May 1917, and again in the same place in May 1918, but in 1919 it was not found.

Unusual songs, not belonging to any type, are represented in numbers 24 and 25. These are the only normal songs I have that are not classifiable in one of the seven types. Dr. Tyler, who has described only songs that seemed to him unusual, describes one beginning with four notes alternating on two different pitches followed by a descending trill. In general it is like a type III song, but differs enough at the beginning to be not classifiable. My own records that do not belong to any type are 1.4% of my normal records.

The next point to consider is variation within the individual. This variation consists of three kinds. First, slight variation of a single song; second, possession of two or more distinct normal songs; third, certain peculiar seasonal variations that are evidently abnormal. The first of these is a common form of variation, tho apparently not found in all individuals. It may be often observed by watching and listening to a single bird for a short period of time. The bird may vary its song by changing the number of introductory notes or slurs, by slightly varying the pitch of the terminal notes, by cutting the length of the terminal trill short, or in type I and II songs by substituting one or more single notes for slurs. Thus I have recorded from a single bird in the course of half an hour seven songs that were all slightly different, yet all of the same type and same general characteristics. Some individuals, however, never show any such variation, but sing their song over and over exactly the same. This was true of the bird singing the distinctive song, number 9. The bird was observed singing in the same place on many different days for more than a month, but there was never the slightest change in the song in form, pitch or time.

The second sort of variation, the possession of two or more

distinct songs by a single individual, seems to be a rare phenomenon in the Field Sparrow. I have only one case on record, that of a single bird that I observed in the same place several different days singing first a type I song, than after a short time changing to a type II. The type I song was distinctly lower in pitch than the type II. Once the bird sang the two songs consecutively, without a pause between them, first the type II song, followed immediately by the type I. In the spring and summer of 1920, I had some forty different individual Field Sparrows under more or less constant observation from day to day. Yet this was the only case where a bird was found to possess two different types of song, a strong contrast to the Song Sparrow, each normal individual of which has several different songs. I have one case on record of a Song Sparrow with twenty-four totally different songs. Such variation is so obvious in that species, that it seems as if more of it would show in the Field Sparrow if possessed in any marked degree.

The last kind of individual variation is a peculiar sort that seems to be common to a number of different species of birds. As late summer approaches and the period of song draws near its close, with the approach of the postnuptial moult, birds begin to vary their songs in many peculiar ways. The songs numbered 26, 27, 28, and 31 are examples of peculiarities of this sort. At this time all general rules for the song of the species seem to be broken, and in Field Sparrows, songs are decidedly irregular in both pitch and time characters, though they are usually of the same sweet quality as before. Intensity is also sometimes varied, and the songs become soft and inaudible from any great distance. For this sort of variation I propose the term postnuptial variation, because it comes with the approach of the postnuptial moult, at the season when nesting duties are completed.

One might suspect that these peculiar songs are those of young birds of the year, just learning to sing. In order to be sure of this point I have carefully examined several birds singing such songs, and always found them adults without any sign of the streaked breast which young would have at this time. When one considers the physiological cause of bird song, it would seem

impossible that any young bird would sing in the year it is born, or, at any rate, before the post-juvenal molt.

The examples of postnuptial variation I have given are the only ones I have on record, though I have often heard others. They are heard less frequently than normal songs and are therefore less easily recorded. Number 26 is believed to be from the same bird that sang song number 8 as its normal one. It was in the same locality, and there are similarities in pitch and arrangement of the two songs, tho not so much so in time. Numbers 27 and 28 are two from another bird, and a bird who normally sang a type I song very similar to song number 1. The bird was heard singing the normal song, and both these variations, together with some others I was unable to record, on July 25, 1920, about a week before the song period of this species began to show signs of diminishing. Number 31 is a song from a bird I could not identify with any whose normal songs were on record, though I should suspect that its normal song was type II. It is the longest Field Sparrow song I have on record.

The Song period of the Field Sparrow, in Connecticut at least, begins with the arrival of the birds in spring, about the first of April, and lasts till August. The average date of first song heard in eleven years' records is March 26. The earliest date is March 12, 1921. This date and two others, March 14, 1902, and March 13, 1915, are probably those of birds that had wintered in the vicinity. The latest date for the beginning of song is April 16, 1916, a year in which the species arrived April 2, but was not heard singing till later. Dates when the song period ceases are more difficult to obtain. Summers have frequently been spent in other localities, out of the range of the Field Sparrow, and in early years no summer records were kept. The average date of the last song heard in five years' observations is August 18, the earliest being August 7, 1920, and the latest August 26, 1918. One still later date, that I did not average in with others because from a different locality, is September 2, 1907, at Milford, Pike County, Pennsylvania.

There is no regular period of song in the fall for this species. Whether occasional birds sing at this season I am not sure. Trust-

ing memory I should say that I had heard the song in the fall, but my notes covering ten years in which I was in the range of this species at this season, do not mention a single instance. During these years I kept daily records of birds heard singing. I have frequent notes on the fall singing of many other species, so I feel justified in stating that fall singing on the part of the Field Sparrow is a rare occurrence.

While these notes pertain to the song period of the species, the period for the individual is quite another matter. Those who have tried going out in the height of the migration in May, to see how many species could be recorded in a single day, have probably noted that few Field Sparrows are in song at that season, though they were singing abundantly a week or so before. I have noted this fact for a number of years, and sometimes found it difficult to find Field Sparrows in the third week in May, simply because so few of them were singing. But it was not until this year that I realized that many individual Field Sparrows are silent for much longer periods than a week, even right in the midst of the song period.

My notes are insufficient at the present time to report as fully as I should like upon this phenomenon. In general, the facts seem to be, that the majority of birds cease singing about the middle of May, and that a good many individuals do not resume again for a month or more. When they do, it may be to sing for only a few days when they cease again for the remainder of the season, or it may be to sing regularly from then until August. I can only guess at the cause of these phenomena. I believe that a successfully mated male bird ceases to sing as soon as incubation of the eggs begins, and that he does not sing again until the young have left the nest, and it is time to start a second brood. The few birds singing in mid-May are then, either birds that are unmated, or birds that have not started to nest at the normal time for the species. Those that resume singing in late May are those whose nests were broken up for some reason. The resumption of song in late June comes when the first brood is out of the nest and the second brood is beginning. Those birds who do not mate successfully for a second brood continue singing for the rest of

the song period. If these are the facts, it is a strong proof that song, in this species, not only originated by sexual selection, but is still mainly useful to obtain a mate. I hope for the opportunity to continue study on this problem, and to be able to make more positive statements later.

One more fact remains to be mentioned concerning the song of this species, a fact that produces some difficulty in tracing individuals, but is otherwise of considerable interest. It is not uncommon to find birds that are near neighbors singing exactly or approximately the same song. I have never found more than two such birds in a locality but it is possible that three or more may occur. I first noticed this fact at West Haven in 1915, when two birds, with a type III song similar to number 13 in the illustrations, sang the song exactly alike as clearly as my ear could distinguish. The birds alternated with each other from points about seventy-five yards apart. I have since found two other cases of type III songs that were alike, and one of type IV. Other types are not so simple and seem less likely to be exactly alike. I have found both type I and II songs sung by two birds in hearing of each other, the songs similar, but not quite alike. In one locality were two type I singers with songs both showing the peculiarities of number 2 in the illustrations, the songs only slightly different from each other. In another case two birds sang type II songs similar to number 8. Numbers 29 and 30 in the illustrations are introduced to show another case of this sort. The resemblance between these songs was more marked than the records show, for while the number 29 song was usually as it is recorded, the bird occasionally, varied it by dropping the final trill to G, exactly as number 30 sang it. These observations show that it is not always possible to be sure of an individual because of the peculiarities of its song alone, but careful observation throughout the season will generally show whether there are in the same locality, two or more individuals having the same type of song.

This phenomenon may be considered support for the theory that individual birds learn to sing by imitating other individuals. If young birds learn to sing from listening to parents, then two birds singing similar songs may be related by blood, either parent

and offspring or both offspring of the same male parent. Possibly they are not related, but sing alike because the younger bird learned its song from the older, or both learned to sing from the same individual.

48 Longview Ave., Fairfield, Conn.

THE BREEDING HABITS OF THE NORTHERN RAVEN IN PENNSYLVANIA

BY RICHARD C. HARLOW.

BORDERING on extinction as a Pennsylvania bird, a few widely scattered pairs of Northern Ravens still exist in the mountains of Snyder, Mifflin, Center, Blair, Clinton, Union, Juniata, Lycoming and Huntingdon Counties (definite breeding records.) It is highly probable that a few still linger in the wildest sections of Luzerne, Columbia, Montour, Northumberland, Wyoming, Sullivan, Bedford and Fulton Counties. I have obtained reliable information of the breeding of these birds in Wyoming and Sullivan Counties during the last ten years and have seen birds taken there, while on April 18, 1919, I saw an adult bird with food in its beak and closely pursued by Crows in Luzerne County. It is probable that there are more pairs left in Center County than elsewhere within the state with Huntingdon, Mifflin and Clinton Counties following closely.

As late as 1900 it was still a fairly common breeding bird in many of the counties named but the decrease during the last ten years has been very marked and unless rigid steps are taken for its preservation, it will be but a very few years before it follows the Wild Pigeon into the list of extinct Pennsylvania species.

The Raven is naturally a very shy species and will not stand the encroachment of civilization and in a number of instances I have known them to leave nests which had been used for generations, as soon as heavy lumbering took place in close proximity to them. In 1917 out of five previously used nests, only one

pair was present. In my investigations throughout the central Pennsylvania mountains, I have located no less than sixteen nesting places, all of which had been used for years but all of which had been totally deserted from two to five years before being located. All of these were absolutely authentic records as in each case the bulky nests were still present on the cliffs.

The number of birds shot can not be the most serious factor in their decrease though it undoubtedly must be considered. Neither can the collecting of their eggs. The writer has taken a number of sets in his studies but never save in the case of one pair in 1910 and 1911 has a second set been taken in the same year. In nearly every instance a second set of eggs was deposited within three weeks and the same number of eggs laid as the first nest contained. As but one brood is raised it can readily be seen that no decrease can be attributed to this factor. The main reason for their decrease is lumbering in the vicinity of their nests or the encroachment of civilization in the shape of too-frequently used roads, or houses being built too close to the cliffs they occupy. In nearly every case these conditions are followed by the disappearance of the birds.

FOOD. During the winter and early spring the Raven is largely omnivorus. I have known them to eat the buds of various trees when hard pressed for food. At this season, however, they feed largely upon refuse picked up about the various deer camps which are so numerous throughout this territory. Bits of fat, flesh adhering to old bones and skin and legs of deer, all of which are commonly left in the vicinity of these camps are greedily sought out. Corn fields on the edge of their mountain fastnesses are visited and any corn that may have been left, devoured. Any dead animal is a feast and I have observed five Ravens feeding on the carcass of a dead dog in the snow.

A fact that I do not believe is generally known is that these birds disgorge pellets after the custom of our Owls.[1] I have repeatedly picked up these pellets on their nesting and roosting ledges and found them during the spring to contain the indigestible

[1] See Hoffman, Auk 1920, p. 454. [Ed.]

portions of various species of insects (chiefly Coleoptera) with bones and fur of smaller rodents in several instances. In several nests I have climbed to when they held young birds, I have found remains of frogs and small garter snakes. In no instances have I noted the Raven destroying birds' nests or eggs in the manner of the Crow and the Grackle and as the bird will always be one of our rarest species there is every reason to urge that it be taken off the list of unprotected species in the state.

I am fully aware that there is a great divergence of opinion concerning the question as to whether birds remain mated for life. Nevertheless in the case of the Raven I am firmly convinced that such is the case. In the case of the male bird especially the species is one of striking individuality. One male of a pair which I have studied for four years is very fearless, very noisy and possesses a deep voice which may easily be distinguished from that of any other Raven. Another male of a pair I have visited four times is invariably silent, soaring once and then leaving the cliff entirely, never varying this procedure from year to year. Still another whose home I have visited three times always utters a note (in addition to the usual vocabulary) that is strikingly like a hoarse laugh "haw-haw-haw-haw." Then there is the striking individuality in nesting of certain pairs. One pair builds always in trees, several times nesting within a hundred yards of one of the finest and most typical cliffs I know. Another pair always uses a cliff surrounded by a splendid forest containing numerous tree sites. One thing is sure, in so far as my experience goes, a pair which one discovers nesting in a tree will always be found thereafter in trees and a pair which once chooses a cliff always remains true to their first choice. Other characteristics are evident also to prove the same birds present at the same nests years after year. One male always comes to meet me when I am yet a quarter of a mile away, taking the same course each year, another always warns the female with a low note and sneaks away over the back of the ridge. Females, likewise, possess the same striking individuality of voice and action as the males. Then in addition to the choice of nest sites as evidenced above, different females lay very distinct types of eggs which, as a rule run very true. One nest al-

ways contains very dark uniform eggs while another holds very lightly marked specimens with a pale bluish-green background. The first nest of the two just mentioned runs to very small eggs, scarcely larger than Crow's, while the second nest always holds large sized eggs. The number in the set does not hold as true, though certain pairs never lay over four eggs and commonly three while others run to four and five. However, this is a problem which seems to be largely controlled by the vitality of the female at the time of reproduction, i. e.—dependent upon her age and the abundance of food during the winter months.

COURTSHIP. Mating takes place during the first ten days in February. A bird occasionally roosts upon one of the old nesting ledges during the winter as is evident by excrement found there but this is by no means usual. The pair return to the cliff together usually the first week in February, at first only for a short visit each day, and later for several visits. A heavy storm at this time usually delays these visits for several days. At this time I have seen them go to the nesting ledge, the female usually alighting on the ledge and the male on a dead stub nearby and spend ten or fifteen minutes there. At this time they often soar together high up in the air with wing tips touching, the male always slightly above the female. At times he will give a wonderful display of his prowess on the wing, either dropping like a meteor for several hundred feet and fairly hissing through the air in the manner of the male Duck Hawk, or tumbling like a pigeon over and over. During this period also, I have found them perched close together high up in an old dead tree caressing each other with bills touching.

VOICE. At this time and during incubation they seem to have a more extended vocabulary than during the rest of the year. As I have already said the Raven shows great individuality in its notes while the voice of the male is much deeper and stronger than that of the female. During the period of courtship and incubation there are two distinct notes that I have not heard at any other time. One is a soft "crawk," which the male gives to the female when he is sitting near her while she is on the nest ledge or incubating. The other is a series of "crawks" given while

on the wing and with rarely a note best expressed by the syllables "ge-lick-ge-lee" given either between the "crawks" or still more rarely as a single note.

This note which I have never seen described has a metallic gurgle which does not carry very far. Then there is of course the usual "crruck" given either singly or repeated any number of times but very frequently repeated three times when the bird is alarmed. There is also a "crroak" given by the male and often repeated four times as a form of song when undisturbed and near the nest, though it may be given singly. These last two notes are given either upon the wing or while perched. The usual wing note is the rolling guttural "crruck." As I have said before, nearly every Raven I have met has some note that is distinctive but the above are the usual types. I have also heard a very distinct hollow, sepulchral laugh "haw-haw-haw-haw." The note of the young is easily distinguished up to the age of at least six months as I have raised the young from the nest up until this time. It is a harsh "cawr" when in the nest, more like the note of a Crow than of a Raven. The young are very noisy and from sad experience in my home I can testify that their desire for food is insatiable and backed up by strong lungs from dawn till dark.

NESTING SITE. There are two distinct types of nesting site chosen here in Pennsylvania—the cliff site and the tree site (the cliff nests outnumbering the tree nests in the proportion of about eight to one. This may be more accentuated because of the present lack of large timber, but the fact remains that according to tradition of the oldest settlers in the vicinity of the nests, some of the cliff sites have been used for seventy years, long before the former great white pine forests were cleared.

One feature is almost invariably demanded by the cliff nesting Ravens and that is that the location be dark and well shaded. Usually the darkest available section of the cliff is selected where the ledges are shaded by hemlocks which often grow on the smallest ledge on the face of the cliff. Very frequently the nest will be placed under an overhanging tongue of rock so that it will be protected from above and I have yet to see a nest in use that is not sheltered either by trees or by an overhang. Their need for

this is made evident when it is realized that nest building is begun and egg laying often started in February, while these mountains are subject to some of their worst winter storms and I have seen the ledges covered with snow and ice as late as March 20. A nest examined on March 16, 1919, was completely draped by icicles frozen from the overhang above to the rim of the nest on three sides. The next year the birds moved to a pot hole where they were more safe. Probably eighty per cent of the cliff nests found have been in mountain gaps and passes on the west side of the gaps, probably because the best shaded cliffs occur on that side though in certain sections where the rock strata lie parallel with the ridge, they breed along the ridge at any well shaded point. The height of the cliff seems to be a secondary consideration to the shade, though rarely is a cliff with a straight drop of less than fifty feet chosen and they run from there up to two hundred feet. The nest is built either on a projecting shelf or ledge either large or small, where suitable protection is offered with distance from the ground a secondary consideration but usually on the ledge most difficult of access. I have found nests in a pot hole only eight feet down on a two hundred foot cliff and again only sixteen feet up from the bottom of a fifty foot ledge. The nesting ledge almost invariably is well up towards the top of the mountain, often on a cliff near the summit, so the birds have a clear outlook of the surrounding country for miles. In such a case the cliff may not be as high but there will be an almost perpendicular talus slope at the base of the cliff running almost to the foot of the mountain. I have never seen a nest on a ledge that had any vegetation on it.

In the case of the tree nesting Ravens, the first requisite they seem to demand is the highest available tree and the second is good cover in the very top of the tree. The tree nests are giant structures over four feet across and yet the birds conceal them so well in the very top of the tree that they are frequently very hard to see from the ground. Usually the wildest mountain swamp is chosen where there still remain some large white pines and hemlocks. I have never known of a tree nest of the Raven to be used two years in succession even though absolutely undisturbed and when young were reared in safety. The birds usually return

to the same swamp but the nest site may be shifted from a hundred yards to a mile or more. One pair brought out four young one year undisturbed and the next year shifted five miles out of the swamp into a heavily timbered gap but returned the following year into the original swamp. I feel sure this is more often the case than is usually supposed for I have known of other cases where birds have been absent from a swamp for a year or more and have later returned.

In the case of cliff nesting Ravens, the birds usually return to the same ledge, though some pairs are much more persistent than others in this respect. Others will return to the same cliff, but vary in the ledge chosen, sometimes nesting on one ledge for several years and then shifting to another. I am strongly convinced that some of these birds (possibly very old ones) do not breed every year. At least in a number of cases I have found the nest completed and both birds present through the breeding season and yet no eggs were laid though the birds exhibited every solicitude at the presence of intruders. In other cases I have known of nests being rebuilt each year and yet only one bird was present. It is possible that the nest in such instances may have been a blind but I cannot feel such was the case where visit after visit would have revealed both birds. A very striking example is given in the case of a pair of birds nesting only a few miles from my home at State College, Pa. Young birds were taken from this pair in 1909 and sets of eggs in 1910 and 1911. From 1911 to 1919 this nest was rebuilt each year and both birds were frequently found about it, but in all this stretch of time no eggs were laid in the nest. It is my theory that the female had become so old that she was infertile as Ravens had nested on this cliff for sixty years according to the oldest settlers. In the summer of 1918, the female was shot by a hunter and the following spring the male returned with a new mate, the old nest was rebuilt and three eggs were laid.

The Raven is essentially a solitary bird and the nests of different pairs are usually a considerable distance apart. The only pairs I know of which nest at all near to one another are six miles apart. I know of no bird which comes into direct contact with the Raven

during the breeding season but the Duck Hawk and as this species stands civilization better through nesting on higher cliffs than the average Raven it usually outlasts the latter. There seems to be a mutual respect between the two species and though they have occasional disagreements I have known them to nest on ledges only forty feet apart, the Raven having young while the Duck Hawk had eggs. Certainly there is no other bird which would brave the Duck Hawk's wrath.

Nest building varies much more according to the individuality of the pair than to the severity of the season. I have gathered together very carefully data for the three last seasons which should serve to exemplify pretty well all types of seasonal conditions found in central Pennsylvania. The season of 1919 could be called fairly normal. During 1920 deep snow lay in the mountains till April 1, while 1921 presented one of the earliest seasons in history. Nest building for the six pairs studied began as follows:

	1919	1920	1921
Pair A	Feb. 16	Feb. 20	March 1
Pair B	Feb. 17		Feb. 14
Pair C	Feb. 17	March 10	
Pair D	Feb. 7	Feb. 18	Feb. 14.
Pair E	Feb. 7	Feb. 15	Feb. 10
Pair F	March 1	Feb. 20	Feb. 20

When the above are averaged with all other data, it is evident that under normal conditions, nest building begins between February 7 and 15, though some individuals may postpone it much later. It may also be readily seen that in the case of this bird seasonal conditions influence it but little. Nest building is done almost entirely by the female. I have seen the male a few times carrying sticks but in each instance they were dropped on the ground near the ledge. On March 2, 1919, I watched a pair building for sometime. The female made four trips at intervals of from ten minutes to half an hour, carrying each time a beak full of deer hair which she placed in the nest as lining. The male constantly accompanied her flying close to her on all the trips and ocasionally giving exhibitions of his aerial prowess for her benefit—once dropping over and over at least sixty feet in the air like a tumbler pigeon. Both birds croaked frequently in the vicinity of the nest, the female

in spite of the fact that her beak was apparently full of hair. The male always perched on a dead stub close to the nest while she worked the lining into the cup. One pair I have watched are usually silent in building but most pairs call to each other in the vicinity of the nest.

Nest building occupies a period of between fourteen and eighteen days. The nest is a huge yet neat structure always conforming in contour with the ledge or crotch on which it is placed. For instance, one pair built in 1919 on a very small ledge and the nest was quite small but in 1920 shifted into a large crack or pot hole, and the nest was a huge structure over four feet across. It is well built into the ledge, pot hole or crotch in which it is placed, sticks being wedged into all available cracks near the base of the nest. The tree nests are usually placed in a double or triple vertical crotch from seventy to over one hundred feet up,—nearly always the highest available strong crotch but in one instance a horizontal crotch four feet out on a large limb was used.

The base of the nest varies from little more than three feet to five feet in the largest nests with an average of almost four feet. The cavity averages a foot in diameter and six inches in depth, the depth varying considerably. In several nests, I have seen one side of the cavity was against the face of the cliff or an upright limb, far from the center of the base and with practically no rim on one side. Usually, however, it is a fairly symmetrical nest for so large a structure. The base is composed almost entirely of dead branches and sticks, freshly broken by the birds themselves. When built upon last year's nest, the freshly broken sticks make a sharp line of contrast where they are built upon the old excrement bespattered rim of the previous year. Some of these dead branches are over three quarters of an inch in diameter and over three feet long. Oak sticks seem to be most frequently used though hemlock, pine and chestnut often occur as well. Frequently freshly broken and budded twigs (usually birch) bruised by the beaks of the birds are found especially well up toward the rim. This was a constant feature of all nests found in 1920, probably because the deep snows covered nearly all piles of brush and dead fallen trees. A great number of dead sticks always fall to the ground

or are blown out in the building and the snow underneath the ledge or tree is covered with them.

The two most constant features of the cup lining are bark shreds and deer hair, the latter predominating when available. When using the old nest the birds tear out the top lining from the previous year which has been fouled by the young and throw it out of the nest so that nearly always one may find small tufts of deer hair on the ground nearby. The bark strips, shreds and fibres are obtained from dead trees, underneath the rough outer bark and they frequently use grape vines shreds as well. Some nests are lined almost entirely with white hair from the belly of the deer and some with red from the back, the birds using just what is available from the carcass. Outside of these main features the lining varies according to material available in the various localities. Tufts of hair from domestic cattle or from dogs as well as horse hair are frequently found. Bits of fur from the skunk, opposum and wild cat, sheep wool, bits of green moss scraped from the sides of rocks are all used by various pairs. I have found one nest heavily felted with material which the birds had been seen picking from an old felt hat and in another lining were bits of rope. Perhaps the most striking nest was one containing a heavy lining of deer hair and flourishing on one side of the cavity was the entire tail of a deer.

A period of several days intervenes between the completion of the nest and the laying of the first egg. This varies with different pairs between three days and a week. During this time the birds visit the nest together at intervals during the day, the female going on the nest and turning around much as a bird does when she is moulding the cup into the right form.

I am appending a table of the pairs previously tabulated to show the dates of the laying of the first egg for the three years noted under nest building:

	1919 normal	1920 very late	1921 very early
Pair A	March 4	March 2	
Pair B	March 5		March 1
Pair C	March 5	April 5	
Pair D	Feb. 22	March 5	March 3
Pair E	Feb. 25	March 2	March 2.
Pair F	March 17	March 15	March 10.

Despite previously published surmises, egg deposition occurs *daily* until the set is complete. In severe weather the female remains on the nest from the time the first egg is laid, leaving only for short trips for food. Under ordinary conditions however, she covers the eggs only at night until the full number is laid.

The eggs vary in number from two to seven with the average set consisting of four or five. Sets of three are quite common and certain pairs never lay more than three or four eggs. Six is very rare while I have but one record each of sets of seven and two.

The eggs vary a great deal both in size and coloration, some being so small as to approach the largest type of eggs of the Crow. The ground color is a pale bluish green or light olive green, spotted, dashed, blotched, streaked or smeared with greenish brown, dark brown and sometimes fewer markings of purplish and black. Some types are so heavily marked that the ground color is almost obscured and the color is uniform owing to the density of the markings. Other eggs are streaked and scrawled lightly, resembling very greatly the common type of egg of the White-necked Raven.

The average size of eggs of the Northern Raven taken in Pennsylvania will run considerably smaller than that of eggs taken farther north. A series of nineteen eggs averages in millimeters 48.4 mm. by 32.5 mm with extremes of 51 mm. and 44.8 mm. in length and 34 mm. and 31 mm. in width.

The four sets (nineteen eggs) measure in millimeters as follows:

Set A.	Set B.	Set C.	Set D.
44.8 × 33	50 × 33	48.6 × 33	49.2 × 34
47 × 31	49 × 32.6	49.4 × 32.6	49 × 34
47 × 32	47 × 31.5	48 × 31	50 × 34
46 × 31.1	51 × 32.5	50 × 32.6	49 × 33
		50 × 31.1	51 × 32.6
			51.6 × 34.2

The period of incubation is twenty days. During this time the male feeds the female upon the nest but does not as a rule sit upon the eggs except in cold, stormy weather when the female leaves the nest for food.

As in the case of nearly all species I have studied where the female is fed on the nest, she leaves it two or three times

daily for exercise and short searches for food. Except when hunting for food, the male is usually found during incubation perched on some dead stub not far from the nest. In such cases he croaks a warning to the sitting female on the approach of an intruder and she often leaves the nest when a person is yet two hundred and fifty yards away. In some pairs, and especially if the male is not on guard, the female sits until one is within fifty yards of the nest but such cases can not be considered as typical. Tree nesting birds usually leave the nest as the tree is approached. Both birds usually soar well up in the air croaking while the nest is being inspected but where a prolonged stay is made in the vicinity of the nest they will frequently perch side by side on a dead tree well away from the nest or leave the vicinity entirely for half an hour or more. The male is much more fearless and demonstrative in his defense of the nest, if defense it may be called.

The young are fed by both birds and remain in the nest for a period of four weeks and when they finally leave can fly short distances fairly well. They are very noisy when food is brought. The rim of the nest and the surrounding rock or limbs are heavily bespattered with white, chalky excrement, the young turning up their tails to the edge of the nest and evacuating over it. In fact I have seen some cliff nests where the cliff was as heavily spattered as a Duck Hawk ledge.

The parents are quite fearless in defense of their home against other birds. Usually they pay no attention to the pestering of Crows but about the nest I have seen them several times pick out individual Crows from the harrassing flocks and drive them clear out of the valley, striking heavily with their beaks while the Crows squawked with fear. They easily drive off the Red-tailed and Broad-winged Hawks and these birds put up but a feeble defense when beset.

The young stay about the vicinity of the nest for a week or more after leaving it but soon scatter and one rarely sees the family parties so common in many closely related species. I have seen but one instance of flocking on January 7, 1917, when a flock of seventeen were counted in a wild mountain section—probably influenced by food conditions.

State College, Pa.

GENERAL NOTES

The Iceland Gull (Larus leucopterus) in California.—A flying field trip into Kern County, California, made by Dr. Loye Miller and the junior author in the closing days of the past year not only furnished an opportunity for personal observation of the important Pleistocene deposits recently discovered in the McKittrick region, but also yielded one interesting record of range extension for a modern species. On December 30, 1921, Dr. Miller picked up a dead gull on one of the levees on the west side of Buena Vista Lake. The bird had evidently been killed by some duck hunter an hour or two before, and aside from semi-decapitation at the hands of the same "sportsman", was in perfect condition.

The specimen differed so radically from any *Larus glaucescens* available in southern California collections that it was sent to Dr. Jonathan Dwight for determination. He pronounces it *Larus leucopterus*, and as such it constitutes a new record for this State. The specific data relative to the capture is as follows: Female, immature of the first winter; No. J 1824, Collection of Donald R. Dickey; Buena Vista Lake, Kern County, California; December 30, 1921; collected by Loye Miller and A. J. van Rossem.—D. R. Dickey and A. J. van Rossem, *Pasadena, California.*

Pelicans in the Interior of Alabama.—During the past season, several newspaper notes detailing the killing of both the White and Brown Pelican, in the interior of the State, have appeared. In October 1921, a hunter killed a large White Pelican (*Pelecanus erythrorhynchos*) at Mountain Creek, in Chilton County, more than 200 miles, in an airline, north of the coast. The bird stopped to rest at a small pond, and was killed and brought to this department and mounted for our collection. It measures nearly nine feet in extent.

During the first few days in February the newspapers carried accounts of the shooting of both species more than 100 miles from the coast. A White Pelican was killed at Selma, Dallas County, and Brown Pelicans (*P. occidentalis*) in Escambia and Butler Counties, and in Montgomery. The bird taken at Georgiana, in Escambia County, is without toe nails on the right foot. It appears to be of great age. The one taken at Montgomery struck a telephone wire during a day flight, killing itself in the streets of the city. The two specimens just referred to are both mounted and in our collection, and measure more than eight feet in expanse.—Peter A. Brannon, *Alabama State Department of Archives and History, Montgomery, Alabama.*

Eider Duck—A Correction.—Under date of April 1890, Vol. VII, No. 2, of 'The Auk,' a note appears stating that a specimen of the Common Eider Duck (*Somateria dresseri*) had been shot near Ottawa. This I regret

to state was incorrect, as the specimen has proven to be a young King Eider (*S. spectabilis*). Through the kindness of Mr. P. A. Taverner, Zoologist of the Geological Survey Department, and Mr. Hoyes Lloyd, Ornithologist of the Dominion Parks Branch, Department of the Interior, who recently placed at my disposal a very large number of specimens of both King and Common Eider, the bird has been positively identified as a young King Eider, in the plumage of the female.—GEORGE R. WHITE, *Ottawa, Canada.*

Anas diazi novimexicana and Grus americana in Nebraska.—Last November while on a shooting trip in Cherry County, Nebraska, I obtained a duck which appeared strange to me. The specimen was saved and has been identified by Dr. H. C. Oberholser as *Anas diazi novimexicana* (Huber). The bird, a female, was shot October 17, 1921, on Dad's Lake, Cherry County, Nebraska, by Colonel Dale Bumstead and is now in my collection. As this is believed to be the first known occurrence of this bird outside of New Mexico, it seems worthy of note.

While on this same trip I heard of a supposed occurrence of the Whooping Crane. The gentleman from whom the information was obtained was a member of the Red Deer Lake Shooting Club, and stated that on October 14, 1921, two Whooping Cranes had alighted on the shores of Red Deer Lake and that one had been killed by a farmer boy in the vicinity. I did not see this bird myself, but believe the report to be authentic.—H. B. CONOVER, *Chicago, Ill.*

Whooping Cranes (Grus americana) in Texas.—On December 23, 1921, it was my good fortune to find four individuals of this rare species in southern Texas. At the time I was in company with Richard M. Kleberg, in charge of the Laurelles Ranch, a sub-division of the great King Ranch.

Perhaps twenty-five miles almost directly South of Corpus Christi there is, except in abnormal seasons, a large shallow lake known as Laguna Larga. It was here that the Cranes were seen. The past winter was an unusually dry season in Texas and the water in the Laguna Larga was very low. On the prairies formerly constituting the lake bottom there were a large number of geese, particularly Snow Goose (*Chen hyperboreus hyperboreus*), and the Hutchins' Goose (*Branta canadensis hutchinsi*). One Blue Goose (*Chen caerulescens*) was identified.

While riding over this territory with Mr. Kleberg, he pointed out at a distance two Whooping Cranes feeding on the prairie. They were probably a quarter of a mile away at the time. On nearer approach they rose and alighted after flying a short distance. There was no possibility of doubt as to the identification. Perhaps five miles farther south two others were discovered. On approaching these we encountered some

marshy ground and the car was stopped at a distance from the birds which we estimated as 300 yards. After watching them for a time through the field glasses Mr. Kleberg fired a shot and the birds both rose. He told me that Whooping Cranes have been coming to Laguna Larga every winter for sixteen years, and that eight is the largest number he has ever known to be there at one time. The same general statement was borne out by other local people who are acquainted with the section.

In this connection I might add that I have recently received from Miss E. Margaret Estlin of Victoria, B. C., a statement to the effect that she saw two Whooping Cranes in northern Saskatchewan in the autumn of 1921. She also forwarded photographs of a living immature Whooping Crane which she states she made in the same general neighborhood "a few years ago."—T. Gilbert Pearson, *New York.*

Florida caerulea in Saratoga County, N. Y.—On April 13, 1922, a a Little Blue Heron (blue phase) adult was seen feeding along the abandoned Champlain Canal one mile north of Waterford, N. Y. Waterford is in the south-east corner of Saratoga County, at the junction of the Mohawk and Hudson Rivers, 160 miles north of New York City. A two day period of very warm weather terminated April 11 with intense thunderstorms and gales.

The bird was very tame and allowed me to approach within forty feet, once at 11.30 A. M. and again at 2 P. M. Each time it was in fine light, even the plumes on head and upper tail coverts showing distinctly. The color, size, length of neck, manner of flight (as a Great Blue Heron), etc., identifying it beyond question as I am very familiar with this heron in the Florida Everglades.

Mr. S. C. Bishop, N. Y. State Zoologist, and Mr. H. P. Chrisp of Albany came to see it the next day but the bird had disappeared.—Edgar Bedell, *Waterford, N. Y.*

Greater Yellow-legs Records at Elizabeth, N. J.—In response to the request of Mr. J. T. Nichols in February, 1922, 'Bird Lore,' for details concerning my statement in October, 1922, 'Auk' that at least two Greater Yellow-legs (*Totanus melanoleucus*) remained here throughout the 1921 breeding season, I submit the following: The Greater Yellow-legs, according to intermittent observations by the writer during the past twenty-five years. is normally absent from the local salt marshes from June 15 to July 15. Between these dates in 1921, I found one or two birds of the species on each trip to a certain locality on the marshes—a cluster of ponds about one mile inland from the shore of Newark Bay. Selected dates of record follow:

June 11—Two birds, calling.

June 18 to 24—Species frequently heard calling about the same ponds by local hunter, but locality not visited by me.

June 25—Two birds, same locality, calling. I quote from my notes of that date: "Two Greater Yellow-legs were flushed from One Tree Pond on the 25th. One returned repeatedly, was very noisy, and did a spectacular tumble while in flight."

July 2—Two birds, same locality, calling.

July 9—One bird, same locality, calling.

The presumption seems to me reasonable that the straggling birds lingering here up to June 25 and those seen in same locality July 2 were identical in view of: (1) the previous complete absence (according to my records) of the species here June 15 to July 15; (2) the presence of two birds in the same locality whenever that locality was visited by me from June 11 to July 2, 1921; (3) the presence of one bird, in the same locality July 9; (4) the total absence of the species from other normally more favored feeding grounds on the marsh from May 21 to mid-July 1921. Since the birds were heard calling and were well seen there was no chance of confusion in identification.—CHARLES A. URNER, *Elizabeth, N. J.*

A Remarkable Specimen of the Piping Plover (Charadrius melodus).—A superb adult female of this rare bird in full nuptial plumage that I secured in May on Long Island, S. C., has the black band on the chest completely coalesced measuring half an inch in width. This band is as wide as on any female Semipalmated Plover (*C. semipalmatus*) in nuptial plumage, but, of course, is not as solidly black basally, the feathers being basally white and apically black as is usual in this species.

If there are other specimens in collections similar to the bird I describe I should like to hear of them, as this plumage for the female is very rare.—ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

Summer Shore Birds.—In the April 'Auk' E. L. Poole records an assemblage of northern breeding Limicoline birds at islands of the Virginia coast, which, for the dates when the recorded observations were made, namely June 30 to July 2, 1921, is truly remarkable. The species noted are as follows: Wilson's Snipe, Dowitcher, Knot, Pectoral Sandpiper, White-rumped Sandpiper, Least Sandpiper, Red-backed Sandpiper, Semipalmated Sandpiper, Sanderling, Black-bellied Plover, Semipalmated Plover and Turnstone.

Let us for a moment suppose we are modifying the given status of these species in a Virginia list, to fit this observation. The simplest way to dispose of it would be to label them all off hand "non breeders sometimes summer." However, the writer's studies of shore-bird movements (mostly on Long Island, N. Y.) lead him to look at the matter differently. Distances mean so little to a migrating shore-bird that the difference of latitude between New York and Virginia is almost negligible, except as it affects climate. In the present connection, the most important difference probably is that, according to available evidence, these birds are more likely

to summer within their winter ranges, without attempting to migrate north, than to do so in transient localities.

Each of the enumerated species has different dates of passage, and each should be considered separately. There is no reason to suppose the Least Sandpiper was in anything but regular migration. The writer has personally observed it on Long Island, bound south, June 22, June 27, and it regularly arrives about the first of July. Dowitcher was probably an early south bound migrant. Though there is no June arrival recorded for it on Long Island, such is to be expected there, since, as a rule, it arrives as early as the more numerous Lesser Yellow-legs, which he has observed as early as June 27. The Pectoral Sandpiper migration is something like that of the Dowitcher, though but few Pectorals appear in early July compared to those later. The Wilson's Snipe would seem a casual early arrival rather than a summering bird, though the earliest such casual Long Island date the writer has obtained is July 10, 1921.

Turn now to the other end of the list, species, the regular northward migration period of which extends well into June, and which may not be expected south again so soon,—Knot, Red-backed Sandpiper, Black-bellied Plover, and Turnstone. If these were moving, they were moving north. The writer would consider the date for all four species a late north-bound date, with a fair chance that the last three would "summer."

This leaves White-rumped and Semipalmated Sandpipers, Sanderling, and Semipalmated Plover, which linger very late north bound, often in flocks, and yet are recorded in return, stray birds, the first week in July. There still is a summer hiatus for each on Long Island, as follows (dates inclusive): White-rumped Sandpiper, June 21 to July 3; Semipalmated Sandpiper, June 28 to July 3; Sanderling, June 15 to July 3; Semipalmated Plover, July 4, one day only. In these species dates over a period of years, with the migration variously early and late, will probably close the gap. That for the Semipalmated Plover, of one day only, may be considered closed. Yet it is doubtful if individuals actually summer on Long Island, though they may do so in Virginia

It will be appropriate, in closing, to call attention to summer presence of shore-birds on Long Island in 1918, as reported in 'Bird Lore,' Sept.–Oct. of that year, page 359:

"The most notable bird phenomenon on this vicinity was the abundance and lateness of north bound shore-birds, several species lingering through June, the last of this spring flight being a single Ring-neck Plover at Long Beach on July 3 (E. P. Bicknell). As the Least Sandpiper had returned there from the North on that same date (about its usual time of arrival), north and south-bound birds actually met in this latitude. It is assumed that the Ring-neck of July 3 was a straggler from the northward flight, as that species had been present through the month of June. It would be interesting to know whether this individual continued northward

until it met members of its own species returning, remained in this vicinity until they arrived, or turned southward at this point with Least Sandpipers and other birds with which Ring-necks associate."—J. T. NICHOLS, *New York City.*

Passenger Pigeons Not in Company Front.—I saw one very large flock of Passenger Pigeons in, I think, the early or middle sixties, in Acworth, New Hampshire.

They came from the south-west by south; they were not in company front with spaces between companies as a regiment marches; the line was a very long one and took a very long time to pass over my father's house; I suspect the front line was rather pointed but became wider and very regular in the number of birds passing in a given time; they were well up and, I am very sure, we could not hear their wings; they passed over a distant wood, a small river, then over irregular fields and pasture and disappeared over a sugar orchard to the north-east.

The alinement was entirely different from the picture by Mr. Frank Bond (Auk, January 1921) and as to alinement I agree with the views of Mr. William B. Mershon (Auk, April 1922).

The flight must have been in April.—ASHTON E. HEMPHILL, *Holyoke, Massachusetts.*

An Unusual Flight of Black Vultures in Nelson County, Kentucky.—Though a breeding bird of Nelson County, the Black Vulture (*Coragyps urubu*) cannot be rated as abundant at any season. A most unusual flight of these birds appeared at my former home, Cherry Hill Farm, near Bardstown during the spring of 1921.

On the morning of March 19, of that year, I observed, flying rather high over the farm, a flock of Black Vultures which by count was found to number not less than ninety-two individuals, a number by far exceeding the total number of these birds recorded in any single year during a period of observation since 1911. The flock presented a beautiful appearance as the birds soared in a spiral column, each bird beating, intermittently, a few short wing strokes. At times the whole flock in a long train coursed across country on set wings in an orderly manner suggesting the movement of a flock of water fowl, but not a bird moved a wing until they again maneuvered into a spiral column. There days later, March 22, I counted eighty-five individuals which were circling over carrion in the same locality. It was observed that not a single Turkey Vulture accompanied these birds on either date.

The unprecedented occurrence of the Black Vulture in the region about Bardstown during March is the more remarkable from the fact that it is generally quite scarce during the breeding season.—BEN. J. BLINCOE, *Dayton, Ohio.*

The Food of Long-eared Owls.—On January 21, 1922, the roosting place of some Long-eared Owls (*Asio wilsonianus*) was located by us in a grove of young pines north-east of Ann Arbor. There were eight of these owls roosting within fifteen feet of each other. The ground below was littered with disgorged pellets and 110 of these were gathered and were found to contain the remains of the following: 111 Field Mice (*Microtus pennsylvanicus*); 8 Lemming Voles (*Synaptomys cooperi*); 4 Deermice (*Peromyscus sp.*); 2 Shrews (*Blarina brevicauda*); 1 Norway Rat (*Rattus norvegicus*).—A. S. Warthin, Jr. and J. Van Tyne, *Ann Arbor, Michigan.*

The Yellow-billed Cuckoo in Europe.—The London 'Field' for Jan. 21, 1922, p. 100, contains a note on the Yellow-billed Cuckoo (*Coccyzus americanus americanus*) illustrated by a photograph of a specimen which was shot on the Scilly Isles, near Lands End, England, in November 1921. Harting's 'Handbook of British Birds' and the 'Hand List of British Birds' by Hartert and others, contain records of 13 earlier occurrences of the species in the British Isles, as follows: England—Cornwall, about 1835; Lundy Island, Devon, Oct. 1874; Helston, Cornwall, Oct. 14, 1887; Bridport, Dorset, Oct. 5, 1895; Ventnor, Isle of Wight, Oct. 1896; Somerset, Oct. 6, 1901; Ringewood, Hants, Oct. 30, 1901. Scotland—Colonsay Isle, Inner Hebrides, Argyll, Nov. 6, 1904. Wales—Stackpole Court, Pembroke, autumn 1832; Aberystevith, Cardigan, Oct. 26, 1870; Carnarvon, Nov. 10, 1899. Ireland—Yoerghal, County Cork, autumn 1825; Dublin, autumn 1832. On the continent the Yellow-billed Cuckoo has been taken at Bois de Lessines, Belgium, Oct. 22, 1874, and near Turin, Italy, Oct. 28, 1883. All of these records are based on birds collected in autumn and most of them on specimens taken in the month of October.—T. S. Palmer, *Washington, D. C.*

A Large Gathering of Kingbirds.—The Kingbird was first seen in 1921, near Prattville, Ala., on April 10 (two individuals). On May 3, sixty individuals were seen together and May 4, 300 or more were seen in the same place. The temperature was 45 degrees F. By May 7, there were only 20 or 30 birds left, and on May 20 only a pair or two.

I had never seen more than twenty individuals together before, and that was in September when they were preparing for their southward flight. Usually the birds are mated by May 10 or earlier; hence the gathering is the more remarkable.

The place of gathering was on the plantation of J. B. Golsan, two miles from Prattville, in a small grove of mulberries.

The fruit was not fully matured but the birds were eating it to some extent.—Lewis S. Golsan, *Prattville, Ala.*

Arkansas Kingbird in Massachusetts.—As supplementing the reference in 'The Auk' for April, 1922, pages 270–1, to the occurrence of

an Arkansas Kingbird (*Tyrannus verticalis*) in Connecticut, November 4, 1921, the following may be of interest. On my return to Edgartown rather late in the afternoon of November 12, 1921, I noticed in passing by two birds sitting in nearby squares of a wire fence at the side of the road somewhat outside the town. The momentary impression created was that they were flycatchers of some sort and something new. I stopped my car abruptly and started to walk back, but a rapidly approaching car frightened the birds to a perch some distance beyond. Another car still further interfered with my efforts, but I finally got a sufficiently good look at them, in a tree close to some farm buildings, away from the road, to satisfy myself as to their identity, though the heavy clouds and lateness of the hour made observation somewhat difficult. However, there was sufficient light to use my glasses and note that one of the birds was larger and more brightly colored than the other. I reported the birds to Mrs. James B. Worden, of Edgartown, who went in search of them the following morning and found them in the same vicinity. She had an excellent chance to observe them at her leisure, for they were not wild, and to watch them hunting for grasshoppers, of which there was a plentiful supply, due to the general mildness of the autumn. I saw both birds again the same afternoon (November 13) in practically the same place as on the preceding day, and Mrs. Worden saw them once more on the 16th. —Francis A. Foster, *Edgartown, Mass.*

Arkansas Kingbird in Plymouth County, Mass.—I wish to add one more definite occurrence of the Arkansas Kingbird (*Tyrannus verticalis*) to the rapidly growing number of records from the New England states. On October 30, 1921, I noted two of these birds on the telephone wires near the railroad station at Marshfield Hills. I had no gun with me at the time, but returning the next morning soon after daylight, I was so fortunate as to find the birds within a hundred yards of the same spot, and in the course of a few minutes collected them both. They were young males, moulting heavily about the head and neck, and in rather poor flesh. They are now in the collection of the Boston Society of Natural History.

For the benefit of other possible New England observers, I might add that in general appearance, aside from plumage-color, the Arkansas Kingbird is extremely suggestive of our native Kingbird. Its size, flight and actions seem the same. The lighter upper parts and yellow under parts are of course, quite noticeable, and the yellowish outer webs of the outer tail-feathers are a good field mark at moderate range, even without glasses. The only note heard was a low "pet-pet," such as a Phoebe might make, accompanied by a nervous jerk of the tail.—Joseph A. Hagar, *Marshfield Hills, Mass.*

Wintering of the Canada Jay in Massachusetts.—The winter of 1921–22 has witnessed at least one proven instance of the sojourn within the

Massachusetts borders of the Canada Jay (*Perisoreus canadensis canadensis*). Several reports alleging this occurrence have been received during the past winter by the State Division of Ornithology. But satisfactory proof was lacking until, during March, a bird of this species was identified by Mr. John A. Farley and myself—found at the end of its winter sojourn in the town of Quincy.

The bird appeared, at the feeding station maintained by Mr. and Mrs. Frank H. Sprague, immediately after the great ice-storm of November 29 last. At first persecuted by the neighborhood Blue Jays, the persistent stranger at length was seen keeping amicable company with one of these—going and coming thus oddly paired during several weeks of mid-winter. The bird was possibly attracted to the place by the extensive windbreak of dense spruce growth that surrounded the house. In one well sheltered tree it habitually roosted.

This Canada Jay completely lost its tail in January; and turned up after a brief interval in early March with an entire new tail—also "in darker plumage" according to the householders. Throughout the winter the bird fed heartily on such fare as baked beans, cheese-rind, cooked carrots and parsnips, bread and spoilt grapes. It became familiar and fairly tame; and occasionally showed a sportive spirit by swooping by or nearly upon Mr. Sprague as he worked in the grounds, seeming to challenge him with harsh chatter and excited cries. Its common note when disturbed was a sharp, penetrating *jip-jip-jip*—not wholly unlike the cry of the Hairy Woodpecker, but generally uttered in triplets. At last reports, March 19, the bird was still on the Sprague estate.

Howe and Allen in their 'Birds of Massachusetts' give only three previous records for the State; one seen early in summer, 1875, one taken October 25, 1878, and one taken October 17, 1889.—Arthur J. Parker, *Boston, Mass.*

The Lapland Longspur in Colorado.—Prior to 1898 the prevailing winter Longspur of Colorado was known as the Lapland Longspur (*Calcarius l. lapponicus*). After subspecies *Calcarius lapponicus alascensis* was erected (1898) these winter Longspurs were all classed under *alascensis*; but since that year there have been recorded three or four specimens of *C. lapponicus lapponicus* as taken in Colorado.

On the evening of December twenty-second, of last year, at six o'clock, during a mild blizzard, with a dense snow fall, I heard overhead hundreds of small birds calling to each other as they flew southward over my residence. The calls, at the time, seemed to me to be those of Horned Larks or Snow Buntings, but a positive determination could not then be made.

Within a few days of this event, Dr. E. E. Evans and Mr. Edward Hellstern, both of Fort Morgan, Colorado, reported to me that hundreds of small birds had been killed in their town during the storm of December 22 by striking houses, wires, etc. Mr. Hellstern felt sure they were Lapland

Longspurs (*C. l. lapponicus*). This diagnosis was one of so much importance and interest that he was requested to send me a specimen, which he did promptly and which, on examination, proved his determination to be correct, that the specimen (others being similar) was true *lapponicus*. Later on Dr. Evans picked up more than twenty of these storm-killed birds and sent them to me; the lot was of mixed complexion, mostly true *lapponicus*, but some *alascensis*. The Biological Survey confirmed my identifications, but reported that many of the specimens of *lapponicus* were not typical, being rather lighter than usual.

I have long suspected that the seeming rarity of the Lapland Longspur in Colorado was more apparent than real, and probably due to lack of properly identified material and insufficient investigation.—W. H. Bergtold, *1159 Race St., Denver, Colo.*

Bachman's Sparrow (Peucaea aestivalis bachmani) in N. E. Illinois.—On April 23, 1922, I took an adult male of this species at Beach, Lake Co., Ill. It was found in one of the pine groves along Lake Michigan and was apparently alone. Dr. C. W. G. Eifrig found a number of birds at River Forest, Ill., during May and June 1915, and secured a specimen which is the only other record of the capture of the species that I can find for this region. (Auk, Vol. XXXVI, p. 522) Dr. A. Lewy saw one in Jackson Park, Chicago, in June 1918 and a note in the 'Wilson Bulletin' (Vol. XXVIII, p. 200) reports them breeding at La Grange, Ill., in 1916, but goes into no detail. This is the first record for Lake County and the farthest north that the bird has been found.—Colin Campbell Sanborn, *Field Museum of Natural History, Chicago, Illinios.*

The Carolina Junco (Junco hyemalis carolinensis) on the Coast of South Carolina.—On February 4, 1922, I observed a flock of about twenty Juncos near my home and among them a deep bluish bird which differed materially from the others. This bird was so very restless that I followed it for nearly an hour before I procured it. Upon comparing the specimen, which is an adult male, with specimens from the mountains of North Carolina in my collection, and also with typical *J. h. hyemalis* from Mt. Pleasant, I found the bird to be identical in coloration, size and color of the bill with the former. Here is a case of a supposedly resident non-migratory form occurring on the seaboard of South Carolina, which is, of course, accidental. Previous to the capture of this bird one of the worst sleet storms ever known had prevailed for three days in South Carolina, North Carolina and Georgia, the entire surface of the ground being covered with ice to the depth of more than an inch. The capture of *J. h. carolinensis* is an addition to the fauna of South Carolina and makes the forty-fifth species I have added to the State list.—Arthur T. Wayne, *Mount Pleasant, S. C.*

Junco oreganus montanus in Oregon.—It is rather strange that the Montana Junco (*Junco oreganus montanus*) has not hitherto been recorded from Oregon. It appears to be a fairly common bird both in summer and during the migrations in the eastern part of the State. The following Oregon specimens are in the Biological Survey collection of the United States National Museum:

259673	♀	Barren Valley, altitude 3950 feet, near Cord	Oct. 11, 1916,	H. H. Sheldon
242986	♂	Bend	April 15, 1915,	G. G. Cantwell
242260	♀	Millers, mouth of Deschutes River	April 10, 1915,	S. G. Jewett
259668	♀	Homestead, altitude 3500 feet	June 7, 1916,	H. H. Sheldon
259667	♂	Homestead, altitude 3500 feet	June 7, 1916,	H. H. Sheldon
259670	♀	Homestead, altitude 3500 feet	June 9, 1916,	H. H. Sheldon
258307	♀	East Pine Creek, 2½ miles northeast of Cornucopia	Sept. 1, 1915,	M. E. Peck
258305	♀	East Pine Creek, 2½ miles northeast of Cornucopia	Sept. 1, 1915,	M. E. Peck
242271	♀	Beech Creek	July 2, 1915,	S. G. Jewett

—Harry C. Oberholser, *Washington, D. C.*

Evening Grosbeak at Ellenville, N. Y.—On the morning of April 19, 1922, as I was wandering through an open patch near to a small wooded tract, a good sized bird flew past me and lit in a nearby birch tree. Its large beak and striking markings convinced me, at once, that it was an Evening Grosbeak. It allowed me to approach to within about five feet of the tree and showed no signs of fear. I watched it for about five minutes during which time it scarcely moved and then it flew and alighted on the ground about twenty feet away. As I approached it again flew and lit in a second tree and this time paid no attention to my careful observation from all sides. It was a full plumaged male bird. Soon my attention was distracted by what sounded like a number of English Sparrows and turning I saw that it was a whole flock of these Grosbeaks, about twenty in number, with more males than females. They were feeding on sumac trees and were quite tame. When I reported the incident I was told that a flock had been observed several times this winter, the last about three weeks ago. I have been absent all winter, so was not aware of this. Although this is the first time I have ever seen the species I am positive of the identification and am reporting it because Mr. E. H. Eaton in his 'Birds of New York' gives it as rare in the State and gives no records at all for it in Ulster Co. Neither does he give any dates as late as this.—George C. Rose, *Ellenville, N. Y.*

Evening Grosbeak at Winsted, Conn.—I think we can establish a new Connecticut record for the Evening Grosbeak. I have observed

a flock of from twelve to twenty of this species every few days all winter and saw fourteen individuals as late as May 7, and two May 8, that were surely acting as if they intended to nest in this vicinity. The 'Birds of Connecticut' gives a much earlier date for "last seen."—E. E. MOFFATT, *Winsted, Conn.*

Rare Winter Birds at New Hampton, Iowa.—Northeast Iowa observers have been very fortunate during the past winter in seeing a number of rather rare winter visitants. During the latter part of November I began to observe the Redpolls (*Acanthis linaria*) in small numbers, about four to ten comprising a flock. By Christmas they had increased until flocks of thirty to fifty were seen, not only in this county (Chickasaw) but in Floyd and Mitchell Counties as well. I had seen these birds a number of times prior to this winter, but never in such numbers. The past winter was not colder than commonly, but we had much more than the usual amount of snow.

On January 22, a flock of twelve Evening Grosbeaks, (*Hesperiphona vespertina*) was seen in New Hampton, and during the same week others were observed at Osage, in Mitchell County. The birds for the most part fed on the seeds of the box-elders and by the time they were through with a tree, the snow beneath would be littered with the pods. The birds remained about three weeks in this vicinity.

On February 5, the Bohemian Waxwings (*Bombycilla garrula*) visited New Hampton, and as there were a number of groups in different parts of town at the same time, it was estimated that there were about forty in the flock. They remained about ten days. The Waxwings were also seen by the Osage observers.—CHAS. J. SPIKER, *New Hampton, Iowa.*

Bohemian Waxwings at Topeka, Kas.—On November 28, 1921, a small flock of Bohemian Waxwings was seen flying south very rapidly. I saw no more of them until January 25, 1922, wnen there was a flock of about forty present. January 26 the flock had increased to about sixty. Apparently a few Cedar Waxwings were mixed in with them. The following day the birds were seen at close range feeding on cedar-berries. On the twenty-eighth the note was heard, but no birds seen.

Not until February 23, was the note again heard. March 13 a large flock of Waxwings was seen. The majority, if not all of them, were Bohemians, judging from the notes. Time did not permit a close investigation. March 14, four birds were seen. On the following day about six were seen, and that was the last appearance for this season.

This is the second season in which this bird has been present in the last five years. Great numbers were here during the wide-spread southern visitation of 1919–1920.—A. SIDNEY HEYDE, *1615 College Ave., Topeka, Kas.*

Wilsonia pusilla chryseola in New Mexico.—A specimen of *Wilsonia pusilla chryseola* in the Biological Survey collection of the United States National Museum adds this subspecies to the list of the birds of New Mexico. It was discovered in a recent rearrangement of the collection, and is of interest in extending the known migration range of this form considerably to the east. It is a juvenal female, No. 196903, United States National Museum, and was taken by Mr. Ned Hollister at Riley, Socorro County, New Mexico, on September 24, 1905.—HARRY C. OBERHOLSER, *Washington, D. C.*

Wilsonia pusilla pusilla in Colorado.—Although the eastern form of Wilson's Warbler (*Wilsonia pusilla pusilla*) has a number of times been credited to Colorado, there seems to be but a single published record that is based upon recent specimen examination. This is cited by Mr. Ridgway (Bulletin U. S. National Museum, No. 50, II, 1902, p. 710). Since, however, the full data have never, so far as we are aware, appeared in print, it may be well, for the sake of those who have not access to the specimen, to publish these particulars. The bird in question is an adult male, taken at Fort Garland, Colorado, on May 28, 1873, by Mr. Henry W. Henshaw. It was originally catalogued in the United States National Museum collection as No. 79,516, but was subsequently exchanged and is now in the Colorado Museum of Natural History at Denver, Colorado. —HARRY C. OBERHOLSER, *Washington, D. C.*

Nesting Sites of the Long-billed Marsh Wren.—Mr. Aretas A. Sauders in the April number of 'The Auk' states that the Long-billed Marsh Wren "breeds mainly, if not entirely in cattail marshes" and he adds it has been his experience that this bird "is found only in those marshes containing the narrow-leaved cattail."

In the extensive Topsfield meadows of the Ipswich River this bird breeds abundantly, not in cattails, but chiefly in the great bulrush (*Scirpus validus*). A list of the plants among which it builds its nest here may be found in my 'Birds of Essex County' and a photograph of the nesting region constitutes the frontispiece to the Supplement to the same work. —CHARLES W. TOWNSEND, *98 Pinckney St., Boston.*

Defense Note of Chickadee (Penthestes atricapillus atricapillus). —On May 17, 1921, noticing a hole about a foot from the ground on a fence post, I stooped down and peered into the cavity to see if it contained a nest. As I did so there issued from the hole a harsh, hissing sound that was decidedly startling. Securing a stick I thrust it repeatedly into the entrance, each time provoking the hissing sound. Unable to account for this extraordinary salutation and obsessed with the idea that it might be produced by a snake, I pried away a piece of the wood and out flew a chickadee that had been defending a nest containing eight eggs.

I have examined numerous nests of this species in various parts of its range, but have never had a similar experience.—A. W. SCHORGER, *Madison, Wis.*

Notes from Collins, N. Y.—I note in the last 'Auk' Mr. Thomas L. Bourne's account of the nesting of the Alder Flycatcher in Erie County. My records from 1912 contain an account of the breeding of one to three pairs in the town of Collins, in three different swamps. Before this time, I am inclined to think that I confused it with the Acadian Flycatcher.

Within easy walking distance, in fact almost in sight, are always two singing males and about one mile distant, usually another. On June 13, 1917, I found a nest being built and it soon contained three eggs. It was between four and five feet up, in a spice bush, in a swampy place, not well concealed. Since then, every season has brought a singing male to the same area, but I have never tried to find the nest. As the bird is now singing there, I shall make an effort to locate it.

The Cardinal Grosbeak was first observed by me May 5, 1913, and has been seen every year since, the greatest number at one time being six, on December 26, 1921. As these were all females, there must be at least nine, as there are three adult males besides. On May 7, 1922, in the woods of the hospital grounds, I found a female building. The nest was not well hidden, in a hemlock, five feet from ground and contained one egg. On May 12 the nest was empty and finely crushed egg shells under it. On May 15, I found the female beginning another nest, about seven or eight feet from the ground, also in a hemlock, poorly concealed; she is at present incubating, in spite of too numerous red squirrels, crows and jays.

Another pair are constantly in the same location near the Cattaraugus Creek, year after year. Gowanda, two miles distant, boasts of one, if not a pair, and several have been taken near Eden (Erie County) for the Buffalo Society of Natural History.

Several Canadian Warblers are nesting as always, also the Louisiana Water-Thrush, Juncos, several Parula, Magnolia, Hooded, Blackburnian Black-throated Green and Mourning Warblers. I have also in times past found the nest of the Black-throated Blue Warbler.

On June 18, 1917, I found the nest of the Migrant Shrike with six newly hatched young. Nearby, parents were feeding another brood, out of the nest. This is the only nest of this species that I have found.

On June 6, 1915, I found a pair of Blue-headed Vireos building in the Gowanda Glen. Owing to my absence during the summer, I did not follow the subsequent history of the nest and have never since found them breeding.—ANNE E. PERKINS, M. D., *Gowanda Hospital, Collins, N. Y.*

Notes from Essex, Massachusetts, 1921.—Uria troille. COMMON MURRE.—On May 18, I secured a female on the Essex River, in Essex. It appeared to be in a somewhat sickly condition and its tarsi were somewhat swollen, facts which may account in part for its presence here at this late date. Its stomach was replete with the remains of fish. This is the first definite record of this species for Essex County. The mounted specimen is now in the collection of the Boston Society of Natural History.

Sterna caspia. CASPIAN TERN.—Three birds appeared on the Essex River, August 31. They were seen fishing in the river and later resting with Herring Gulls on the shore. Two others were seen on September 8 near the mouth of the river. The stomach of one secured, was kindly examined for me by the U. S. Biological Survey, and its contents found to be two codlings (*Urophycis tenuis*).

Casmerodius egretta. AMERICAN EGRET.—On the salt marsh of Essex River I saw a flock of three on August 19.

Phalacrocorax carbo. COMMON CORMORANT.—On September 2, flying low over the water off the mouth of the Essex River, two birds of this species were identified with a flock of twenty-five Double-crested Cormorants. They were obviously larger than the latter with white breasts, and their paler bills and gular patches were in distinct contrast to the orange color of these parts in the Double-crested species. All the birds in the flock held their bills widely open as they passed, presenting a peculiar appearance.

Coturnicops noveboracensis. YELLOW RAIL.—One was started in the salt marsh on September 10.

Limosa fedoa. MARBLED GODWIT.—A female was killed on the Essex River on August 31. Its stomach contents were examined for me by the U. S. Biological Survey and found to consist of 14 Nereis, 6 *Gemma purpureus* and at least four other bivalves, and a seed of the pondweed (*Potamogeton pectinatus*).

Falco rusticolus obsoletus. BLACK GYRFALCON.—A fine black female was shot on the edge of the salt marsh at Essex on December 10. It had been seen several times previously and when killed was said to have been attempting to carry off a domestic hen from a farmer's flock. Its crop was greatly distended and on examination was found to be crammed with the flesh and breast feathers of a Black Duck. The specimen is now mounted in the collection of the Boston Society of Natural History. —ARTHUR B. FULLER, *Boston Soc. Nat. Hist., Boston, Mass.*

Notes from Lauderdale, Fla.—At Ft. Lauderdale, Fla., February 12, 1922, I saw a male Nonpareil (*Passerina ciris*). A day or two later I saw it again in the same general vicinity where, for the third time, I saw it, February 19. On the last occasion I flushed it, together with some Grasshopper Sparrows, from a growth of tangled grass where, evidently, these finches had taken refuge for the night. Maynard refers to this

species as shy and retiring and states that they seldom show themselves in the open. Twice, at least, I observed the bird under conditions which would seem to controvert this statement.

A Loon (*Gavia immer*), was picked up on the golf links, Ft. Lauderdale, Fla., February 14, 1922. The bird appeared to be uninjured and submitted, without resentment, to stroking and handling. It made one or two attempts to paddle away, using only its feet, but made little progress. Finally it was carried to the river, about three miles away, where it dove and splashed with evident enjoyment.

The golf links are about as far from the ocean as from the river. The country round about consists of pine land, cut-over land overgrown with palmetto scrub and some truck gardens. It may be that the links, set in an opening of this scrub growth, being nearly level and perhaps covered with mist at night, appeared to the bird as a body of water and that, once down, it was unable again to rise. I think most accounts agree that a Loon is unable to rise save from the water.—Edw. R. Ford, *Grand Rapids, Mich.*

Birds Using their Wings as a Means of Propulsion under Water.—Mr. Charles W. Michael and his companion can be congratulated on the excellent photographs and extremely interesting article on the Harlequin Duck which appeared in 'The Auk' for January, 1922. Closely watching various species of diving birds, an observer notes two distinct means of propulsion under water: (I) by the use of the wings which are not fully expanded in this swimming below the surface, but are bent at the carpal joint; (II) by using the feet alone.

Having for many years had opportunities of observing the Murre (*Uria troille troille*), Razor-billed Auk (*Alca torda*), and Puffin (*Fratercula arctica arctica*), diving when the water was clear, around the coasts of Scotland, I can confirm the statement that these species all use the wings for propulsion, that is to say, the Auk family make use of the wings when travelling beneath the surface.

The Manx Shearwater (*Puffinus puffinus puffinus*) does the same, although of course it is not such an inveterate diver as the Auks. The other big petrel, the Fulmar, is said to do the same but I cannot speak of this bird from personal experience.

In Class II there are Loons, Grebes, Mergansers and Ducks. Close to my home, on the Lower Arrow Lake, B. C., there is a beaver dam, where almost any day may be seen Buffleheads, Golden-eyes, Coots, Mergansers and occasionally other species as well, diving at pretty close quarters. The water is still, and usually quite clear. Here these birds use the paddles alone for propulsion under water. The following is the mode of precedure with them when feeding.

A Golden-eye or Bufflehead floating on the surface which is about to dive, may or may not submerge a little before doing so, and may occasion-

ally partially open the wings before plunging headforemost beneath the surface. Very little disturbance of the water takes place when diving. it is more a slipping beneath the surface, which is often effected by a slight spring, forward, not by a leap out of the water as is generally the case with grebes. Under water the wings are closed, the tail spread, the paddles work alternately, being thrown vigorously backwards and outwards, thus avoiding the edge of the spread tail, and are sometimes thrown back so far that they appear to reach a little higher than the back. The tail is sometimes depressed, sometimes elevated, to adjust the angle the bird wants to maintain. When bottom is reached the body is held down by the strokes of the paddles, generally at an angle of about 45°, while the bill rakes the mud. Occasionally the bird slightly loses its balance and rolls over a little, when a wing is shot out, but the moment balance is restored the wings are kept closed, the paddles doing all the work.

The return to the surface is by buoyancy alone, the head breaking water first, the body sloping slightly downwards, though sometimes the duck pops up horizontally, the feet are not used in rising to the surface.

One October morning I was lying concealed in my sneak-boat in the very shallow narrow outlet of a remote slough, when a female Golden-eye evidently mistaking the boat for a log, came feeding slowly past me, within a few feet of the punt, the water was so shallow that when she submerged there was only a thin film over her back.

The paddles were thrown back with great force, and appeared sometimes to reach a little higher than the level of the back. The bottom being soft she could not have obtained any foothold by walking.

A male Merganser is very conspicuous under water, using the feet alone for propulsion, and can travel at an extraordinary pace in this submerged swimming.

Very interesting is the observation made by Mr. Michael that the Harlequin uses its wings under water, and walks over a gravel bottom.

Is the Harlequin an exception to the general rule, or do all diving ducks have to use their wings in a current? Even here perhaps, they are used more to retain balance than as natatory organs. All of my observations on diving ducks have been in waters where there was little or no current.

The Coot also uses its feet when diving. This clown among birds may often be seen after a short dive to pop up tail first.

Mistakes may be made when observing birds under water, especially if the water is not very clear, light may strike the tail or paddles, and make it appear as if the wings were employed. There is little use in observing wounded or captive birds, for a broken wing or even broken wing tip may easily give the impression that the wings are used.

Guillemots or Razor-bills when confined in a comparatively small aquarium, feeding on the dead or moribund fish supplied them, may give up using their wings and reach their food with a few kicks of the feet.

In this case the birds appear at first to use their wings which often come in violent contact with the glass; this apparently soon teaches them that the use of the wings is both superfluous and painful.

I have not so far observed a Harlequin in the Beaver Dam, though they are not very uncommon on the Arrow Lakes.—J. E. H. KELSO, M. D., *Edgewood, Lower Arrow Lake, B. C.*

Bird Catastrophe at Gordon, Nebraska.—The morning papers of February 20, 1922, carried the news that on the previous night thousands of birds were killed at Gordon, Nebraska, during the blizzard and that no one in the town was able to identify them. I immediately wrote the mayor, Mr. Frank Coates, and asked him to mail me a specimen for identification along with full particulars concerning the storm. He very kindly sent me two specimens. I found them to be Lapland Longspurs (*Calcarius lapponicus lapponicus*). To confirm my verdict I mailed one bird to the Bureau of Biological Survey, and from it received word that my identification was correct. The following information was furnished by the mayor of Gordon.

At six o'clock on the evening of February 19, the temperature was 34 degrees above zero. During the night it stood at 16 degrees above. Early in the evening (Sunday) a sleet fell, followed by a fall of one inch of snow. There was no wind and the snow was evenly distributed. At 10 P. M. the birds were flying against the cluster lights in such numbers that the lights were turned off. Next morning before one store having dim lights fifty-five birds, dead or nearly so, were counted. A conservative estimate as to the number killed was twenty-five to a city block. Thousands were killed in the surrounding country, the morality extending over a territory ranging 200 miles both east and west of Gordon.

'The Auk', volume XXIV, for October 1907 gives an account of a similar tragedy which occurred in Minnesota in 1904.—BESSIE PRICE REED, *Lawrence, Kansas.*

Flight Songs and Mating Songs.—The interesting paper by Mr. Aretas A. Saunders on 'Flight Songs and Mating Songs' in the April number of 'The Auk' brings up several questions. Of the birds that are in the habit of singing from perches, a certain number—possibly more than we know—indulge at times in flight songs which generally differ more or less from the ordinary song. The fact that many birds continue their songs, both ordinary and flight, long after the courtship season, does not, it seems to me, prevent these being true courtship songs. The Robin sings even into August and the Song Sparrow has been known to sing every month of the year. The songs of most birds deteriorate as the season advances.

The full song of the Black and White Warbler, to which Mr. Saunders refers, is in my experiences common during the courtship season, but may

be continued afterwards. Nearly all birds sing again in the fall,—the well known "autumnal recrudescence of the amatory instinct"—and the full flight song is often to be heard at this season.

Mr. Saunders has shown clearly that the Bobolink-like flight song of the Meadowlark is more ancient than the ordinary song. In some cases, it seems to me, the flight song is plainly an elaboration of the ordinary courtship song, while in others it is a return to a more primitive and passionate, but less evolved utterance. Some ecstatic flight songs fall under both these heads, and by this I mean that parts of the flight songs are elaborations and variations of the common songs, but that numerous inarticulate and sometimes unmusical notes of a primitive nature are intruded.—CHARLES W. TOWNSEND, *98 Pinckney St., Boston, Mass.*

Aeolian and Percussion Bird Music.—The non-vocal forms of bird music, though not so widely distributed as those produced in the throat, are sufficiently positive to be deserving of separate recognition and special terms.

There are two types: those sounds produced by any kind of tapping or beating, which may be termed percussion music; and those induced by the action of extraneous air currents on the outstretched wing feathers, a type perhaps best designated as aeolian. Like song, both are probably expressions of sex pressures in the male, and both are primarily seasonal.

Percussion music may be subdivided into that made with the bill and that with the wings. The best example of the former is the resonant roll of the Flicker, which in mating season is sure to find some hollow tree or tin roof that will megaphone the returns of his "riveting hammer" equipment.

The second kind of percussion music has its clearest exposition in the Ruffed Grouse, which produces his gallant staccato accelerando, as instantaneous photography shows, by beating his wings together above his back. It is the tympani roll of the timberland symphony. Drumming is so prominently a part of the cock Grouse that it is not limited to his mating season.

Aeolian music is the most picturesque form of avian expression. Who that that has seen the Nighthawk mounting in the soft May twilight to his spectacular swoop and aeolian boom can have watched the act without a thrill?

But the master aeolian artist is a bird of a widely different order. A sketch from the migration course in the lower Susquehanna valley will illustrate.

After a whirling, piling February blizzard there is a thaw and a warm drizzle. With upland bare and soggy and meadow flooded March comes at misty midnight. And with it, out of the gloom above, comes the mysterious winnow of the Wilson's Snipe. It is the first nocturnal announcement

of spring and the long-billed herald plays to no spot but sends down his message to the sleeping village as well as to the broad bottoms of his favorite swamp.

That softly penetrating roll of the Snipe is one of the most remarkable sounds in bird life. Very rarely, in wild cloudy weather during the vernal flight, the bird, "drums" in the daytime. From memory of one of these exhibitions the wiry traveler can be imagined up in the damp darkness going through the extraordinary evolutions that accompany the sound. He drives about in large circles for several minutes at highest speed, which is well above ninety miles an hour with the Snipe; then, suddenly setting his outstretched wings, he descends sharply and obliquely for fifty or sixty feet, producing the roll or winnow as he makes the drop. The sound is apparently made with the primaries thrown into vibration by the strong rush of air. Knowing the harsh 'skeap, skeap' of the Snipe as he jumps from the grassy springhead it is impossible to imagine the beautiful, soft roll as coming from his throat.

The first impression of the Snipe's winnowing is that it is the roll of the Screech Owl. With closer attention it seems too big and too free a tone for an *Otus*, and it is altogether out of habit for that bird to give a roll without an ascending quaver at the end. But nevertheless the tone is so owl-like that it suggests the possibility of some large, unfamiliar variety of owl, to which the novice is likely to attribute it or leave it a mystery for later solution. And one of the singular qualities of this curious music is that the position of its source is altogether baffling. When as a boy I first heard the sound in the daytime I hunted through the nearby trees for the expected owl only to discover to my amazement that the roll was coming from a Snipe, in a mad acrobatic act, nearly half a mile up in the air.

The whole performance appears purposeless, particularly in a species so seemingly unemotional as the Snipe. It may be a wild game evolved in both sexes by the stored up energy which is provided in extra amount for the great flight, and evoked by a stormy day or some wild element in the gloomy night. Frank Forester, the classic writer on American field sports of the early nineteenth century, described large wisps in the act of drummery, though the snipe he saw may have been all males at that. Or it may have to do solely with the mating instinct and be an act of bizarre intersexual gallantry peculiar to the male.

In any event the aeolian music of the Snipe in the night always touches a responsive cord within me as deeply as does the twilight song of the Wood Thrush.—HERBERT H. BECK, *Franklin and Marshall College, Lancaster Pa.*

RECENT LITERATURE

Nelson's 'Lower California and its Natural Resources.'[1]—Most American naturalists are aware of the extensive exploration of the Lower California peninsula carried on in the years 1905–1906 by Dr. E. W. Nelson and E. A. Goldman, as part of the general survey of Mexico under the auspices of the Biological Survey, but hitherto no report of their operations has appeared. The present account is based primarily upon this exploration with such additional matter, from other sources, as seemed worthy of incorporation. The itinerary covers about thirty pages and is a most interesting narrative, illustrated by numerous excellent views of the varied country through which the expedition passed. Then follows an account of the physical characteristics; recent geological history; coastal and other mountains, comprising descriptions of the various mountain chains of the peninsula; the plains, valleys and streams and the coastal islands. The climate is then considered, and finally the plant and animal life, and its distribution. There are 166 mammals, 286 land birds, 144 water birds and 102 reptiles known from Lower California and its adjacent islands.

Dr. Nelson considers that there are five natural faunal areas in the peninsula; the San Pedro Martir District, comprising the summits of the Sierra Juarez and San Pedro Martir Mountains, forming the back bone of the northern part; the San Diegan District lying immediately west of this; the Colorado Desert District to the east; the Vizcaino Desert District reaching from coast to coast and occupying the middle section of the peninsula and the Cape District ocupying the southernmost third.

In terms of the life zones, the mountains of the San Pedro Martir District are Transition with a slight area of Canadian; the San Diegan District is Upper Sonoran, while all of the Vizcaino and Colorado Desert Districts and a narrow strip running through the Cape District, with isolated areas at the Cape itself, are Lower Sonoran, the rest of this district being Arid Tropical, except for an area of Upper Sonoran on some of the highest mountains. The Arid Tropical and Lower Sonoran of the Cape District are, however, so inextricably interwoven that it is difficult to separate them.

Most of the species peculiar to this region occur on the mountains south of La Paz, (Upper Sonoran) and doubtless originated when this area was cut off from the rest of the peninsula by the sea. Lists of the characteristic animals and plants for each district and zone are given. The final pages of the report comprise sections on natural resources and agriculture and an excellent bibliography with historic comments on the early explorers and their routes.

Dr. Nelson has furnished us with an account of this interesting peninsula

[1] Lower California and its Natural Resources. By Edward W. Nelson, Chief, Bureau of Biological Survey, United States Department of Agriculture. Memoirs Nat. Acad. Sci. Vol. XVI. First Memoir. 4°, pp. 1–194, pll. 1–35. 1921.

which will constitute the standard work of reference for a long time to come, and thanks to his researches we, for the first time, gain a clear knowledge of the distribution of life in this region. The admirable map which accompanies the report is a valuable feature.—W. S.

Chance's the Cuckoo's Secret.[1]—We have from time to time noticed in the pages of 'The Auk' the publications in the British ornithological magazines dealing with the life history of the Cuckoo and commented upon the remarkable results that our friends across the water have attained through their painstaking studies. In the fore-front of this investigation stands Mr. Edgar Chance, who has now embodied all of his observations on the egg-laying habits of this interesting bird in the little volume before us.

He has recorded four seasons' detailed observations on what he considers to be the same female Cuckoo, and other chapters on more general problems in the life-history of the species. One must read the book to appreciate the painstaking work of the author and the importance of his investigations and only a brief summary of them can be given in this connection.

In the first place British ornithologists seem to be unanimous in the belief that individual Cuckoos lay eggs that are characteristic, and distinguishable from the eggs of other Cuckoos in the same vicinity, and also that under normal conditions an individual Cuckoo is parasitic on only one species of bird—the victim being known as the "fosterer" in the language of Cuckoo investigation. It would also seem that in the case of the Cuckoo it is the female that selects the breeding area and not the male, this being in contrast to the custom prevalent in most birds as described in Howard's 'Territory in Bird Life' and in Mr. H. Mousley's recent paper (Auk, July 1921).

The unique method of nidification in the Cuckoo is ample explanation for this reversal, while the fact that the same type of egg is found in the same area year after year, indicating the presence of the same individual cuckoo, confirms this theory.

All of these points are supported in a convincing way by Mr. Chance's observations. The most interesting features of his researches are however that he was able in 1920 to locate probably every egg laid by this special Cuckoo which he had under observation, and in most cases to record the day and hour at which each was laid. There were 21 eggs laid, all but one in Meadow Pipits' nests, and at intervals of two days (except in two instances). So accurately did Mr. Chance forecast the day and nest in which the Cuckoo would probably lay that he was able to place a motion

[1] The Cuckoo's Secret. By Edgar Chance, M. B. O. U. London: Sidgwick and Jackson, Ltd. 3, Adam Street, W. C. 2, 1922. pp. 1–239. Numerous illustrations. Price 7s. 6d. net.

picture operator in a blind and secure a film of the performance, including the removal of a Pipit's egg by the Cuckoo, which seems normally to follow the deposit of its own egg.

The Cuckoo's exact method of depositing her egg seems not to have been even yet positively ascertained. Mr. Chance construes his evidence as proving that an egg can be laid in eight seconds, the period that the bird under observation was actually on a nest and left and egg which was not there before, and he also claims that in other instances it can be retained for hours after the bird has become anxious to lay it. Mr. Stuart Baker in a valuable paper on this subject, (Bull. Brit. Ornith. Club, March 13, 1922,) regards both of these claims as improbable and says "there is no doubt that in the vast majority of cases the egg is laid by the Cuckoo elsewhere, and deposited by means of the bill in the foster-parent's nest," and further suggests that she holds her egg in her gullet and regurgitates it into the nest. He actually interprets Mr. Chance's film as endorsing this view.

Mr. Baker's admirable paper should also be read with care especially as it deals with African and Asiatic Cuckoos which must obviously be considered in solving the broader problems of the Cuckoo's parasitism.

Mr. Chance is certainly to be congratulated upon his admirable work and the great progress that he has made in the attempt to solve "the Cuckoo's Secret."—W. S.

Beebe's 'A Monograph of the Pheasants' Volume III.[1]—True to their promise the publishers have brought out the third volume of this splendid work promptly on the appointed date. The character and make-up of this volume are quite up to the standard of the preceding ones and so fully have these been described in our reviews of the other parts[2] that it seems unnecessary to repeat the details here.

With regard to the plates of the several species this volume is quite up to the standard of the last, although, as in that, we miss the exquisite work of Thorborn and its wonderful reproduction which characterized Volume 1. The eight plates by Lodge will probably be most appreciated among those of the volume now before us, although those by Jones, representing the races of *Phasianus colchicus*, are admirably adapted to the differentiation of these closely allied birds. The characters are far better shown in a series of "portraits," such as these, by a single artist, in which the birds are placed in approximately the same position and drawn

[1] A Monograph of the Pheasants. By William Beebe, (etc., etc.,) Volume III. Published under auspices of the New York Zoological Society by H. F. and G. Witherby, 326 High Holborn, London, England, 1921. Royal Quarto (12 × 16 in.) pp. i–xvi + 1–204, colored plates 24 (Nos. XLV–LXVIII), photogravures 21 (Nos. 40–60) and 4 maps. Edition limited to 600 copies; price of each volume $62.50.

[2] For notice of Volume I see 'The Auk' January, 1919, of Volume II, July, 1921

to about the same scale, with only a trace of background, than in more artistic compositions where the subjects appear in varied poses and of different size. These pheasant portraits that Mr. Jones has produced are wonderful in their almost Japanese delicacy and detail and in some the suggestion of iridescence is most successfully produced.

The work of two new artists appear in this volume, L. A. Fuertes and E. Megargee. The plate of the Cheer Pheasant by the former is an admirable representation of the principle of protective coloration so characteristic of this dull colored species, but its very excellence in this respect makes it less beautiful than the plates of the more brilliant species which Lodge has depicted against dark backgrounds. Fuertes was again unfortunate in having to portray Elliot's Pheasant of rather bizarre coloration and the large size of the figure has not added to the effect. Megargee's single plate of Soemmerring's Copper Pheasant, is not very impressive, while Knight's plate of Reeve's Pheasant demonstrates again, to our mind, the impossibility of using oil paintings for such reproductions as these. All of this discussion serves only to demonstrate what must be apparent to all who have been asked to judge of the respective merits of various pictures of mammals, birds, etc. It is almost impossible to say "this one is the best" because one may be the most artistic, another the most important from a scientific point of view, another most perfect in pose and coloration, while in all, the method of reproduction and the size of the figures are bound to influence our opinion.

The photogravure reproductions of Mr. Beebe's photographs of the haunts of the various species are particularly beautiful and continue to add much to the attractiveness of the work. The groups covered by Volume III comprise the Koklass Pheasants (*Pucrasia*); the Cheer (*Catreus*); the True Pheasants (*Phasianus*) and the Long-tailed Pheasants (*Syrmaticus*). The last group is remarkable for the great difference in the plumage of the several species, including the copper-colored Sommerring, the yellow and black Reeve's and the blue and black Mikado. The last, the most recently discovered pheasant species, has an interesting history. It is a native of Mt. Arizan, Central Formosa, and was described by Ogilvie Grant in 1906 from two central tail feathers obtained from a native head dress. They were so distinctive as to indicate a new species beyond any question of doubt, though a specimen of this beautiful bird was not obtained until several years later.

The genus *Phasianus* is one of the great puzzles of the pheasant family on account of the large number of hybrid forms developed in captivity and the confusing array of geographic races. Following his criterion on genera—that they are geographic and non-overlapping, Mr. Beebe has separated *Syrmaticus* and *Calophasis*, sometimes included in *Phasianus*, and he has recognized only two species among the forms remaining. *P. versicolor* of Japan, and *P. colchicus*, extending, in one or another of

its forms, all across Asia from the Sea of Azof and the Black Sea to the Japan Sea, and from the Tropic of Cancer to 48° N. Latitude, in Manchuria.

Beebe's statement that in a single ricefield in China representatives of three recognized forms of *P. oalokicus* were obtained and two undescribed ones illustrates the variability of the characters that might and often have been regarded as of systematic value. No less than 35 forms of this species have been named of which Beebe recognizes 23, admitting at the same time our very imperfect knowledge of the birds in much of their wide range, and the lack of suitable series of specimens for study and comparison. We shall look with interest for the fourth and concluding volume of this notable work which the publishers promise before the close of the year and congratulate both them and the author upon the painstaking care and energy which have produced such splendid results. —W. S.

Van Oort's 'Birds of the Netherlands'.[1]—This triple installment consists entirely of plates, covering many of the Hawks, Eagles, Quail, Shore-birds, Rails and Cranes, the thirty plates bearing numbers between 89 and 183. They are of the same high quality as those in preceding parts and, although the large size of some of the figures and the crowding on certain of the plates detract from their artistic beauty, they are admirable for purposes of identification while the representation of the various plumages adds materially to their value. The publisher is making excellent progress with the plates and promises the letter press in succeeding parts.—W. S.

Swann's revised 'Synopsis of the Accipitres.'[1]—Mr. Swann after a further study of his subject decided to issue an entirely new edition. This follows exactly the style of the original edition but contains many additions and changes in nomenclature, and some alteration in the systematic arrangement. The author has received assistance and criticism from many sources and has had access to a manuscript list of Accipitres prepared recently by Mr. W. L. Sclater, all of which have helped to make the list as complete "as human exertion" can make it, though the author admits that further corrections, etc., are inevitable. The number of species now

[1] Ornithologia Neerlandica. De Vogels van Nederland door Dr. E. D. Van Oort. Gravenhage Martinus Nyhoff. Afl. 10–12.

[1] A Synopsis of the Accipitres (Diurnal Birds of Prey). By H. Kirke Swann, F. Z. S., M. B. O. U. Corresponding Fellow, Amer. Orn. Union. Second Edition, Revised and Corrected throughout. London. Wheldon and Wesley, Ltd., 38, Great Queen Street, Kingsway, W. C. 2, and 28, Essex Street, Stand, W. C. 2. Price 6s. per part. Part I (Sept. 28, 1921) pp. 1–63; Part II. (Jan. 3, 1922). pp 65–122; Part III. (Feb. 16, 1922) pp. 123–178 plus addendum to pp. 3–4 and Errata et Addenda i—iii; Part IV. (May 20, 1922) pp. 179–233 plus title, preface and index, i–viii and 1 page Errata et Addenda.)

recognized is 329 as against 316, and of genera 99 as against 89 in the earlier edition.

We notice that the genera *Climacocircus*, *Urubitornis*, *Oroaëtus*, *Thalassoaëtus*, *Cuncuma*, *Helicolestes*, *Aviceda*, and *Rhynchofalco* have been recognized, while *Neohierax* (p. 184) is proposed as a new genus, with *Poliohierax insignis* as type, and the following new forms are proposed *Odontriorchis palliatus guianensis*, Paramaribo, Surinam; *O. p. mexicanus*, Tampico, Mex., and *O. forbesi* Pernambuco, Braz. (all on p. 159).

Polioaëtus we notice is shifted from the Pandiones to the vicinity of *Haliaëtus* and *Pithecophaga* to the Harpy Eagles, while the genus *Archibuteo* (now *Triorchis*) is still regarded as distinct instead of being merged with *Buteo* as advocated by Oberholser.

Mr. Swann has certainly spent much time and pains on this new edition of his list and our knowledge of the group has been materially advanced. —W. S.

Mathews' 'The Birds of Australia'.[1]—Three parts of Mr. Gregory Mathews' great work have appeared since our last notice, and in all the high standard previously established has been maintained. They cover the families Cyclostomatidae, Turdidae and Sylviidae.

The first of these includes a number of characteristic Australian birds which the early settlers were at a loss to identify with the British species that they were familiar with at home, and hence we have such divergent popular names as, Babbler, Song-Lark, Field-Wren, Scrub-Robin, etc., while some especially notable species have received distinctive names from their peculiar vocal accomplishments as the Pilot Bird and Coach Whip Bird. The habits of all these are covered by quotations from Gould, and contributions from Ashby, Carter, White and other present day Australian ornithologists and correspondents of the author.

The thrushes are represented only by a species of *Oreocincla* and the so-called "Chats."

We note two new races described in Part 5. *Drymodes brunneopygia intermedia* (p. 214) western So. Australia, entire diagnosis "paler and more rufous" and *D. beccarii adjacens* (p. 218) Aru Islands "darker above especially on the tail." There is no clue as to where the types may be found. If as is quite probable another form may some day be found on the Aru Islands, this careless description of Mathews' will serve as a stumbling block until the location of the type is discovered and a comparison is made. It is curious that an investigator who has spent so much time and energy in ably correcting and elucidating the careless work of his predecessors should himself be guilty of similar lapses.—W. S.

[1] The Birds of Australia. By Gregory M. Mathews. H. F. and G. Witherby London, England. Vol. IX. Part 5 (December 15, 1921), Part 6. (February 15, 1922), Part 7 (April 4, 1922).

Bannerman on "The Birds of Southern Nigeria".[1]—This first instalment covers all of the passerine birds from Southern Nigeria contained in the British Museum collections; the other families it is proposed to treat in another paper in the same journal. The paper is almost entirely systematic though a few collectors' notes on habits, food, etc., are interpolated. Usually only range is considered with reference to the original description of the form, but there are often a few lines of "distinctive characters" and in complicated cases considerable discussion of the status of the various described forms.

We notice the following new race described:—*Trichopra senegalla dunbari* (p. 340), Lake Chad district. Apparently this is the only one but without some list of new forms or some distinctive style of type it is very difficult to locate them in a paper abounding in technical names. Mr. Bannerman has prepared a review which will prove a most important work of reference for students of African birds.—W. S.

Witherby's "Handbook of British Birds".[2]—This part of Mr. Witherby's excellent "Handbook" covers the remainder of the ducks, the Steganopodes and the Tubinares. All the admirable characteristics of the earlier parts are maintained, the descriptions are full and the questions of range and related forms carefully worked out. In this connection many American birds are referred to and the work becomes of importance to American ornithologists in the study of our own avifauna. The American Eider, *Somateria dresseri*, is here regarded as a subspecies of *mollissima* as is the Pacific bird.—*supra*.—W. S.

Kunhin's "What Birds Have Done with Me".[3]—This little volume consists of a number of popular essays on various aspects of bird life and of bird biographies, with much that is autobiographical and a strong undercurrent of bird protection running through it all. The book will attract many, especially children, and doubtless win many to the cause of the birds. Ornithologists are correct for the killing of birds for any purpose whatever. The examining of 27,000 stomachs of birds for scientific analysis of their food habits is characterized as a 'successful move upon the part of the Allies—Scientists, Plume Hunters and Curators,' and the statement follows "back of much of the so-called scientific examination

[1] The Birds of Southern Nigeria. Including a detailed review of the races of species known to occur there. By David A. Bannerman, M. B. E., B. A., M. B. O. U., F. R. G. S.; C. F. A. J. I. British Museum (Natural History). With Notes on the Topography of the Country—By Rupa Lang and Willoughby P. Lowe, M. B. O. U. *Novon Zoologica* Tring. IX. Pars. i. pp. 256–338. 1922.

[2] A Practical Handbook of British Birds. Edited by H. F. Witherby, F. C. I. F. Jourdain, N. F. Ticehurst, B. W. Tucker. Vol. II. pp. 353–448. February 28, 1922.

[3] What Birds Have Done With Me. By Victor Cunkin, M. D., & Bird Lover. Boston, Richard G. Badger. The Gorham Press. 1922. pp. 1–274. Frontispiece portrait of the author. Price $2.00 net.

of birds' stomachs is the commercial demand for a stuffed specimen." Such statements only serve to illustrate the author's unfamiliarity with this side of his subject. We could never have secured adequate laws for the protection of our birds had we not been able to meet the hard-headed legislators with just the scientific facts that the author criticises, and those laws as he ought to know have stopped the commercializing of stuffed specimens.—W. S.

Recent Papers by Riley.—Mr. J. H. Riley has recently described[1] *Dryonastes grahami* (p. 59) from Szechuan, China, and proposed[2] a new genus *Orospingus* (p. 61) for *Chlorospingus goeringi* Scl. and Salv. He has also pointed out[3] that *Noddi* Desmurs 1847 is the first tenable name for the Inca Tern, that *Grammopsittaca lineola maculata* Ridgway really came from Venezuela and should be called *tigrinus* Souancé[3], and that *Anas arcuata* Horsfield is still available for the Tree Duck[4] to which it has usually been applied, although without consulting all the references it is difficult to follow Mr. Riley's rather involved explanation.[3]—W. S.

Check List of the Birds of Essex County, Mass.[5]—It is only proper that such an active organization as the Essex County Club should want a field check list of its own and the present little pocket list is the result. It is astonishing to see how many different field check lists there are, and nearly everyone has personal preferences and likewise finds points to criticise in the lists of others.

In the present list we find that with names and dates, etc., all in heavy faced type and printed close together, it is extremely difficult for the eye to separate them and almost impossible for it to carry across to the proper line on the opposite blank page. The probability of getting one's notes opposite the wrong species is so great as to constitute a serious danger. The printing and character of the data, are however, excellent. —W. S.

McGregor and Marshall on Philippine Birds for Boys and Girls.[6]—We are constantly astonished at the spread of the interest in popular bird study but nothing in recent literature has emphasized this fact more

[1] Proc. Biol. Soc. Washington, p. 59.
[2] Ibid. p. 61.
[3] Ibid. p. 77.
[4] Ibid p. 78.
[5] Check List of the Birds of Essex County, Massachusetts April, 1922. (12 pp. of list and 12 blank for notes). To be had from the Secretary, 88 Washington Square, Salem, Mass.
[6] Philippine Birds for Boys and Girls. By Richard C. McGregor and Elizabeth J. Marshall with Illustrations by Macario Ligaya. Manila. Bureau of Printing 1922. pp. 1–138.

strikingly than the appearance of a Philippine bird book for boys and girls with a diagram of a Hornbill on the cover and colored plates and cuts of various species by a native artist, Macario Ligaya!

The text by R. C. McGregor and Elizabeth J. Marshall is printed in extra large type and is very popular and conversational in character to attract the attention of the young reader, but it carries nevertheless reliable information on the habits of the species and a plea for their protection.

A list of the thirty species considered is given at the end with their technical names and some further information, while there is also a list of bird books relating to Philippine ornithology.—W. S.

The Provencher Society of Natural History of Canada.[1]—Under this title appears a pamphlet describing the incorporation and objects of the Society i., e., the study and conservation of the wild life of Canada. There are also articles on sanctuaries, game, fish, and various birds; and poems, some original and some reprinted. The illustrations are numerous and varied, with many excellent little color sketches of birds by F. C. Hennessey. A curious feature of the book is that upon turning it over vertically and opening what was the back cover we have all the matter relative to the society and its objects reproduced in French but with different supplementary matter and different illustrations, thus cleverly meeting the difficulties presented in a country where the public which it is desired to reach speak some one language, some the other.—W. S.

Todd on the Genus Myiobius.[2]—This is a very careful review of a difficult group, of which Mr. Todd recognizes seven species and four additional races. Only one of these, *M. villosus peruvianus* (p. 32) Rio Tavara, Peru, is new. Mr. Todd comments upon the danger of hastily relegating similar forms inhabiting adjacent geographic areas to the category of subspecies, as many so treated, especially in the Tyrannidae, have ultimately proven perfectly distinct species.—W. S.

Misses Baxter and Rintoul on some Scottish Breeding Ducks.[3]—This little work presents an historical record of the nestings of a number of species of ducks in Scotland with detailed accounts of the character of their occurrence in the several counties and abundant references to sources of information. The species considered are the Gadwall, Wigeon, Shoveller, Pintail, Pochard, Eider, Common Scoter, Goosander and Red-breasted

[1] Secretary of Society Jos. Matte, Roads Dept. Prov of Quebec, P. Q.

[2] Studies in the Tyrannidae. II. The Restricted Genus Myiobius. By W. E. Clyde Todd. Proc. Biol. Soc., Washington. 35, pp. 17–38. March 29, 1922.

[3] Some Scottish Breeding Duck. Their Arrival and Dispersal. By Evelyn V. Baxter and Leonora Jeffrey Rintoul. Edinburgh. Oliver and Boyd. Tweeddale Court, 1922. pp. 1–80. price 5s. net.

Merganser and there is a final chapter on conclusions in the matter of the extension of the breeding range in ducks.

Four of the chapters have already appeared in 'British Birds' but the others are here published for the first time. The work forms a valuable contribution to our knowledge of the Anatidae.—W. S.

Chapman on South American Birds.—In a paper on the genus *Pygochelidon*,[1] Dr. Chapman recognizes *P. cyanoleuca* of rather wide range in the mountains, *P. patagonica patagonica* of the South Temperate zone, *P. p. peruviana* (p. 7) a new race from Peru, and *P. flavipes* (p. 8) a very distinct species represented by one specimen from Prov. Juvien, Peru. Interesting comments on the probable origin and distribution of the forms follow. In another contribution[2] Dr. Chapman describes eight new races and species from Colombia, Ecuador and Argentina including *Jacana scapularis* (p. 3) from western Ecuador, the first record of the genus from west of the Andes.—W. S.

Wetmore and Peters on New American Birds.[3]—*Teledromas* (p. 41) is proposed for *Rhinocrypta fusca* Scl. and Salv. *Dendrocygna bicolor helva* (p. 42), San Diego Co., Calif., is described as new, the North American bird proving to be separable from true *bicolor* of Paraguay. *Colaptes pitius cachinnans*, (p. 43) Argentina, is proposed as new and the genera *Pituipicus* and *Soroplex* are merged in *Colaptes*. *Brachyspiza capensis choraules* (p. 44), Rio Negro and *Saltator aurantiirostris nasica* (p. 45) Mendoza, Argentina, are described, and Dr. Wetmore independently describes *B. c. mellea* (p. 39) from Paraguay[4] and three new forms of Tinamou;[5] *Rhynchotus arcanus* (p. 434). Parana, Argentina; *Nothura maculosa savannarum* (p. 435) Rocha, Uruguay; and *Calopezus elegans albidus* (p. 437), San Juan, Argentina.—W. S.

Bangs on Philippine Birds.[6]—This paper consists of comments on eight species and descriptions of five new forms all from extensive collections presented to the Museum of Comparative Zoology by Governor General Forbes. The new races are *Lalage niger mitifica* (p. 80) Lubang; *Aegithina*

[1] The Distribution of the Swallows of the Genus *Pygochelidon*. By Frank M. Chapman. Amer. Mus. Nov., No. 30, February 28, 1922, pp. 1–15.

[2] Descriptions of Apparently New Birds from Colombia, Ecuador, and Argentina. By Frank M. Chapman. March 2, 1922.

[3] A New Genus and Four New Subspecies of American Birds. By Alexander Wetmore and James L. Peters. Proc. Biol. Soc., Wash., 35. pp. 41–46. March 20, 1922.

[4] Description of a Brachyspiza from the Chaco of Argentina and Paraguay. *Ibid.* pp. 39–40, March 20, 1922.

[5] Three new Birds of the Family Tinamidae. By Alexander Wetmore. Jour. Wash. Acad. Sci., 11, No. 18, Nov. 4, 1921.

[6] Notes on Philippine Birds Collected by Governor W. Cameron Forbes. Bull. Mus. Comp. Zool. LXV., No. 4. April, 1922, pp. 77–84.

tiphia aequanimis (p. 81) Palawan; *Orthotomus ruficeps nuntius* (p. 82) Sulu Archipelago; *Zosterops forbesi* (p. 83) Camiguin and *Oriolus xanthonotus persuasus* (p. 83) Palawan.—W. S.

Palmer on Game as a National Resource.[1]—In this report Dr. Palmer has presented a mass of information that is essential to the proper understanding of the game problem, and those interested in legislation, game reservations private or public, and the ethics of hunting, will find it invaluable as a work of reference. The principal kinds of game in the United States are first briefly considered, then the value of game from various points of view, and methods of increasing and maintaining the game resources.

Under the head of "value of game," the possibilities of game raising by farmers and the leasing of hunting privileges are considered as a means of profit and also the importance of hunting as an antidote for excessive brain work. In attempting to estimate game values in dollars and cents we learn that under normal conditions there are probably five million hunters in the United States and license fees for hunting should total nearly five million dollars, while New York alone estimates the value of its game supply at fifty-three million dollars. Interesting maps show the character of hunting restrictions in the various states, while the records of game killed show some surprising figures. In Pennsylvania it is stated that in 1919, 287,001 Ruffed Grouse, 5,181 Wild Turkeys, 46,319 Bobwhites, 27,769 Woodcock and 28,714 wild water-fowl were killed! In New York in 1918, 41,757 Ruffed Grouse, 8,999 Bobwhites, 19,249 Woodcock, and 114,643 wild water-fowl and in Minnesota in both 1919 and 1920 over two million game birds of various kinds were killed.

It is hard to understand the discrepancies in some of these figures while the Wild Turkey figures for Pennsylvania are surprising.

Space prohibits further quotations from Dr. Palmer's report but everyone interested in the game problem should read it carefully.—W. S.

Hewitt's 'The Conservation of the Wild Life of Canada.'[1]—This is a posthumous volume, the work of the brilliant Dominion Entomologist who for ten years so ably conducted the entomological service of Canada and did so much along the broader lines of conservation of wild life, and whose premature death in 1920 has already been recorded in these pages.

The admirable manuscript that he left behind on wild life conservation which is now published, covers the subject in a most satisfactory way, and while chiefly interesting to Canadians may be read with profit by everyone interested in conservation, and will prove a standard work of reference.

[1] Game as a National Resource. By T. S. Palmer. Expert in Game Conservation. U. S. Dept. Agr. Bulletin 1049. March 14, 1922. pp. 1–48.

[1] The Conservation of the Wild Life of Canada. By C. Gordon Hewitt, D. Sc., Dominion Entomologist and Consulting Zoologist. With numerous illustrations. New York, Charles Scribner's Sons. 1921. pp. 1–344.

As is natural, much of the volume relates to mammals and to game legislation, the chapters concerned more especially with birds being: "The Extermination of Wild Life," "The Game Birds and Larger Non-Game Birds of Canada," "Birds in Relation tc Agriculture," and "Government Reserves for the Protection of Birds." The usual information with reference to attracting birds and providing nest boxes, etc., is clearly set forth, and brief accounts of the present and past abundance of the game birds, their habits, etc., are presented. In this connection we note that the author is satisfied that man's slaughter of the Passenger Pigeon and Great Auk was sufficient to account for their extermination, without resorting to fanciful theories.

Some "bird counts" by Mr. N. Criddle which are presented are interesting for comparison with similar counts at localities in the United States. An area of 76 acres, chiefly prairie, contained in three years 58, 72 and 74 pairs of breeding birds respectively, of from 21 to 27 species, while an area of 26 acres of woodland contained in the same years 65, 72 and 66 pairs, of 28 to 31 species. All in all Dr. Hewitt's work will present in concise form to all Canadians the same sort of information that the Biological Survey furnishes, in its bulletins, to the residents of the United States and is a most welcome contribution to the literature of conservation.—W. S.

Hartert's 'Die Vögel der palaarktischen Fauna.'[1]—Three parts of this work reached this country during February last. No. XV (Bd III, 1), covers the Alcidae, Otididae, Gruidae, Rallidae and Tetraonidae. No. XVI (Bd. III, 2) treats of the Phasianidae and begins the additions and corrections which are continued in No. XVII (Bd. III, 3). This famous publication is thus rapidly approaching completion—W. S.

Food Habits of Two Owls in Britain.—Like all previous studies that[2] of Dr. W. E. Collinge reveals a preponderance of good over harm in the feeding habits of the Barn Owl. Mice and voles constitute nearly 70 per cent of the food and injurious insects and birds (House Sparrow, Starling, and Blackbird) together, an additional 18 per cent. Shrews, miscellaneous small birds, and neutral insects compose the remainder of the diet.

The Little Owl (*Carine noctua*), a bird introduced in to the British Isles and now common, also is reported[3] upon by Dr. Collinge. Game-keepers and poultry-raisers have condemned the species and have destroyed large numbers of the birds as "vermin." The present study of its food habits is based on the examination of 212 stomachs and 260 pellets, besides various lots of material brought to the nests. It was found that

[1]Berlin, R. Friedlander & Lohn.
[2]The Barn-owl. Journ. Ministry Agr. 28, No. 10, 1922, pp. 1–4.
[3]The Food and feeding habits of the Little Owl, Ibid., Nos. 11–12, Feb.–Mrach, 1922, pp. 1–17.

voles and mice make up 31 per cent of the food, injurious insects, 30 per cent, neutral insects 17 per cent, earthworms 7 per cent and wild birds 4 per cent. The latter, in this case also, were chiefly injurious species. Game birds were barely represented and poultry not at all. Consequently Dr. Collinge's judgment is distinctly favorable to the Little Owl.— W. L. M.

Bird Enemies of Two Exotic Insect Pests.—The wattle bagworm (*Acanthopsyche junodi*) is termed the worst of pests of the black wattle in South Africa. From a study of nearly 60,000 specimens it has been determined that birds destroy about one per cent of these insects. The birds that have been observed to prey upon the bagworm are Sprews, Parrots, Weaver-birds, Silver-eyes and Butcher-birds[1].

In Trinidad a blight both directly and indirectly due to the sugar-cane froghopper (*Tomaspis saccharina*) is the most serious drawback to cane-growing which ranks second among the industries of the island. Damage as high as £300,000 has been caused by this blight in a single, year. In an extensive account[2] of the natural enemies of the froghopper Mr. C. B. Williams records 3 species of birds as preying upon the immature insects and 17 upon the adults. The Forked-tailed Flycatcher (*Muscivora tyrannus*) is said to be the most important bird enemy of the froghopper. —W. L. M.

The Ornithological Journals.

Bird-Lore. XXIV, No. 2. March–April, 1922.

When the Birds Come North. By Grace A. Hill.—An account of the spring migration 30 miles north of Nome, Alaska.

The Friendly Phoebe. By Clinton G. Abbott.—Illustrated account of a nesting.

Caught in a Springtime Blizzard. By Margaret A. Bartlett.—At Boulder, Colo.

A Nest-Building Parrot. By Mary B. Sherman.—An escaped pair of Gray-breasted Parrakeets built in a garden at Ogdensburg, N. Y.

The Migration and Plumage papers cover the Red-winged Blackbirds with a plate by Fuertes.

The Condor. XXIV, No. 2. March–April, 1922.

A Large Tern Colony in Texas. By J. R. Pemberton.—Well illustrated.

Notes on Fox Sparrows in California in the Autumn of 1921. By Joseph Mailliard.

A Study of Roosting Holes of the Red-shafted Flicker. By Emerson A. Stoner.—Drilled through the sides of a frame building and roosted inside.

A Law Governing the Elevation of the Nesting Site. By Charles K. Averill.—"Birds with long pointed wings may nest high or low, but the short and round winged are low nesting."

[1]Skaife, S. H., South African Journ. Sci., 17, Nos. 3–4, July 1921, pp. 291–301.

[2]Mem. Dept. Agr. Trinidad and Tobago, No. 1, Jan. 1921, pp. 66–67, and 70–78.

The Wilson Bulletin. XXXIV, No. 1. March, 1922.

Notes on the Road-Runner at Fort Worth, Texas. By George M. Sutton.—An elaborate study of the bird's habits illustrated with drawings by the author.

Florida Burrowing Owl. By C. J. Pennock.—A study of the species on the plains near Punta Gorda, Fla. The writer considers the birds are decreasing.

The Birds of the Cape Fear Region of the North Carolina Coast. By Z. P. Metcalf.—A briefly annotated list.

The Oölogist. XXXIX, No. 2. February, 1922.

Winter Observations in Texas. By James Wood.—From vicinity of Brownwood.

The Blue Grosbeak in Terrant County, Texas. By Ramon Graham.

The Oölogist. XXXIX, No. 3. March, 1922.

American White Pelican at Malheur Lake, Oregon. By A. G. Prill.—Well illustrated.

The Oölogist. XXXIX, No. 4. April, 1922.

Some notes on the Light-footed Rail (*Rallus levipes*). By H. A. Edwards.

Birds observed at East Leake, Goochland County, Va. By Robert W. Williams.

The Ibis. (11 series) IV, No. 2. April, 1922.

On the Sense of Smell possessed by Birds. By J. H. Gurney.—An elaborate consideration of publised data pro and con but no definite conclusion as to whether birds have a well marked sense of smell. As several times mentioned in 'The Auk' there is a deplorable lack of careful field experiments and many of the recorded observations are by no means convincing. In fact some accepted as important by Mr. Gurney are wholly rejected by Dr. R. M. Strong in his discussion of the subject. (Jour. Morph. XXII, pp.. 619–660.)

Notes on the Nest and Eggs of *Stenostira scita* (Vieill.) By H. W. James.

On the Eggs of the Puffin (*Fratercula arctica*). By Percy F. Bunyard.—These eggs are usually heavily blotched but the color is deep-seated and covered by superficial coats of lime. Interesting photographs of eggs illuminated by electric light from within clearly show the striking markings.

The Birds of Jhang District, S. W. Punjab. Part I. Passerine Birds. By Hugh Whistler.—A well annotated list with an introduction dealing with the physical features of the district.

Remarks on the Japanese Petrels of the Genus Oceanodroma. By N. Kuroda.—*Oceanodroma melania matsudariae* (p. 311), Coast of Japan, is described as new, and should, we think, have been spelled *matsudairae*.

Modern Nomenclature and Subspecies. By H. J. Elwes.—A long commentary on the evils of adopting the tenth edition of Linnaeus, and the

establishment of subspecies, modern rules of nomenclature, and the changes which they have, brought about in bird names; but no remedy is offered nor antidote suggested!

Results of a Collecting Trip in the Cantabrian Mountains, northern Spain. By H. F. Witherby.—A well annotated list with an itinerary, description of the country, comparative lists for the Pyrenees, Cantabrians, N. Portugal and the Algeciras and a discussion of the humidity.

Beginning with this issue 'The Ibis' will publish a brief list of papers in the current ornithological journals, following the plan established by 'The Auk' some ten years ago.

Bulletin British Ornithologists' Club. CCLXIV.

Mr. Sclater communicates nomenclatural notes on African Hornbills and Kingfishers and proposes *Bycanistes sharpii duboisi* (p. 45) as new, from Cameroon. Mr. H. F. Witherby describes *Dryobates medius lilianae* (p. 49) from N. W. Spain. Dr. Hartert presents several new forms from Africa and Mr. La Touche a number from Yunnan.

Bulletin British Ornithologists' Club. CCLXV. February 2, 1922.

W. L. Sclater presents a synopsis of *Indicator variegatus* and its allies and the races of *Tricholaema hirsutum*. He also presents as new *T. leucomelan namaqua* (p. 63) Namaqualand; and *Micropus caffer ansorgei* (p. 63) northern Angola.

Mr. Kirke Swann presents an account of his recent visit to America and examination of the Acciptres in the several museums. In this connection he describes *Falco columbarius bendirei* (p. 66) Walla Walla, Wash., type in the Mus. Comp. Zool., and *F. rusticolus alascanus* (p. 67) Norton Bay, Alaska, type in U. S. Nat. Mus. He regards *F. obsoletus* a mere melanistic form of *F. candicans* thus reducing the North American races to two.

Mr. Bannerman describes *Fraseria ocreata kelsalli* (p. 68) Sierra Leone, and *F. cinerascens guineae* (p. 69) Portuguese Guinea, as new.

Mr. Meade-Waldo describes the curious habit of the male Sand Grouse of saturating its ruffled breast plumage with water and carrying it in this way to the young.

Bulletin British Ornithologists' Club. CCLXVI. February 25, 1922.

Mr. W. L. Sclater shows that the generic name *Pterocles* is a synonym of *Pterocles* both applying to the long-tailed Sand Grouse and proposes *Eremialector* (p. 74) for the short-tailed species, type *Tetrao orientalis* Linn. (=*Pterocles arenarius* (Pall).)

Three other new genera are proposed, *Stephanoaëtus* (p. 75), type *Falco coronatus* L., *Cassinaëtus* (p. 76), type, *Limnaëtus africanus* Cassin, and *Tropicranus* (p. 76) for *Ortholophus* O. Grant, preoccupied. *Pterocles burchelli* (p. 74) is proposed for *P. variegatus*, preoccupied.

An account of the eleventh oölogical dinner follows with a list of specimens exhibited.

Bulletin British Ornithologists' Club. CCLXVII. March 13, 1922.

Rothschild and Hartert propose as new *Tanysiptera danae intensa* (p. 91) S. E. New Guinea.

Mr. Stuart Baker presents a valuable paper on "Cuckoos,—Some theories about the birds and their eggs." (see antea p. 433).

Bulletin British Ornithologists' Club. CCLXVIII. May 5, 1922.

Decision is reached not to publish proceedings of the oölogical dinners which are not under the auspices of the Club and have been criticized because of the large number of eggs exhibited and the inconsistency of excessive collecting with bird protection. The Club goes on record as opposed to "collecting eggs in unnecessary numbers" or "taking the eggs of *any* birds in localities where they are rare."

W. L. Sclater continues his comments on nomenclature and taxonomy of African birds.

C. B. Ticehurst describes three new Indian birds and D. A. Bannerman, *Galerida cristata whitakeri* (p. 124) from Tunisia and J. D. LaTouche, *Pericrocotus montpellieri* (p. 125) from Yunnan.

British Birds. XV, No. 10. March, 1922.

Observations on the Breeding Habits of the Merlin. By W. Rowan.—Rearing of the Young (continued in April).

The "British Birds" Marking Scheme. Progress for 1921. By H. F. Witherby.

British Birds. XV, No. 11. April, 1922.

History of the Great Crested Grebe in Dumbartoushire. By Alex. Cuthbertson.

Some Breeding Habits of the Sparrow Hawk. By J. H. Owen.—Part IV.

Notes on the Breeding Habits of the Wood Lark in Dorset. By W. J. Ashford.

British Birds. XV, No. 12. May, 1922.

Ornithological Notes from Norfolk for 1921. 28th Annual Report. By J. H. Gurney.

There is an interesting letter from B. B. Riviere giving the velocity of flight of Homing Pigeons in recent flights, ranging from 52 to 82 miles per hour for distances up to 600 miles.

Avicultural Magazine. XIII, No, 1. January, 1922.

The Proposed New Bill for the Protection of Wild Birds by R. I. Pocock.—Well worthy of study by American bird protectionists.

The Breeding of Gang-Gang Cockatoos. By F. G. Hedges.

Avicultural Magazine. XIII, No. 2. February, 1922.

Aviculture in Japan. By N. Taka-Tsukasa.—Extends back 1700 years (continued in March and April issues.)

Avicultural Magazine. XIII, No. 4. April, 1922.

About Birds in North America. By F. E. Blaauw.—A better account of our birds than most of our foreign visitors write, although New York ornithologists will doubtless be surprised at the occurrence of "*Ceryle torquata*" flying overhead near the "Broadpark" Zoo!

Color Change in Golden Plover. By Hugh Wormald.—Is "well aware that Zoologists deny the possibility of color change in old feathers" and makes "no pretense at being scientific" but is satisfied "that not only is it possible but frequently occurs" and *knows* that a Snipe he once kept did so change. Such assertions do not get us very far!

The Emu. XXI, Part 3. January, 1922.

Black-throated Ground-Bird. *Cinclosoma alisteri* (Mathews). By A. J. Campbell.—With colored plate.

Two New Subspecies of Birds. By H. L. White.—*Gymnorhina tibicen eylandtensis* (p. 163); *Geophaps scripta peninsulae* (p. 163) from North Territory and North Queensland, respectively.

Notes from the Nullarbor Plain. By F. L. Whitlock.—With several photographs of nests including woodpecker-like holes of the new Naretha Parrot.

Some Birds of Groote Eylandt, Northern Territory. By A. J. Campbell.

Types of the Australasian Genera of Penguins. By R. Stuart-Sutherland.

An Impression of the Birds of Australia. By A. H. Wilson. A visiting ornithologist from Great Britain.—Saw 41 species in three hours time and could have added 11 others had a certain swampy spot been visited. "This is a more fruitful walk (aided by a car) than I think any non-tropical country in the world could rival." But the author is probably unacquainted with the daily lists to be made in almost any part of the eastern United States.

Notes on Petrels washed ashore, West Coast, Aukland Province, N. Z. By R. A. Falla.

The Annual Congress and Camp-out of the R. A. O. U.

Some Remarks on Re-naming Birds and the Rules of Zoological Nomenclature. By A. J. Campbell.—Another protest against "bed-rock priority" and methods of type-fixation which cause changes in familiar names, but no remedy is offered. The author seems unaware that the use of the word "indication" in Art 21 of the International Code has been fully explained and discussed (Science, July 5, 1907, etc).

The Emu. XXI, Part 4. April, 1922.

The Lyre-Bird, *Menura novae-hollandiae* Latham. By A. J. Campbell.—With colored plate of *M. n. edwardi*.

Prince Edward's Lyre-Bird at Home. By Spencer Roberts.—Photographs of nests.

The Dusky Miner (*Myzantha obscura* Garld). By Edwin Ashby.

Observations and Records of Australian Sea-Birds, 1920–1. By W. B. Alexander.

Papua—The Land of Birds. By A. H. Wilson.

A visit to the Archipelago of the Recherche, S. W., Australia. By A. F. Bassett-Hull.—Consists of an interesting narrative and a list of 24 species.

Birds Observed near Wellington, N. Z., By R. H. D. Stidolph.

On the Skeleton of the Wedge-tailed Eagle (*Uroaetus audax* Latham). By R. W. Shufeldt.

The Austral Avian Record. IV, No. 7. March 7, 1922.

Additions and Corrections to my Check List, 1920. By G. M. Mathews.

An extraordinary Bird Book. By G. M. Mathews and Tom Iredale.—James Jennings' "Ornithologia or the Birds; a Poem in two parts, 1828." A prose supplement contains some new names most or all of which are untenable. Mathews proposes *Dromaius n. gunni* (p. 175) for the bird figured on Pl. 2, Vol. I of his 'Birds of Australia.'

Captain Thomas Brown, Ornithologist. By G. M. Mathews and Tom Iredale.—A review of the publications of this erratic writer.

The South Australian Ornithologist. VI, Part 5.

A Trip to North-West Australia. By A. M. Morgan.

Notes on Birds seen during a Visit to the Western Darling. By A. Chenery.

Revue Francaise d'Ornthologie. XIV, No. 154. February, 1922. [In French.]

Description of a New Mediterranean Species of Falco. By L. Lavenden. *F. blancheti* (p. 212) Sfax, Tunisia (continued in March issue).

L'Oiseau. III, No. 1. January, 1922. [In French.]

The Bronze Starling, *Lamprocorax metallica* (Temm.). By J. Delacour

Parroquets of the Group *Platycerus*. By J. Berlioz.

A Nesting of the Cardinal. By A. Decoux.—Regrets that owing to the protecting laws it is impossible to procure Cardinals from the United States and all that reach France are the smaller less hardy Mexican forms.

L'Oiseau. III, No. 3. March, 1922. [In French.]

Experiences of a Naturalist in French West Africa. By Dr. Millet-Horsin.

Ornithologische Beobachter. XIX, Heft 5. February, 1922. [In German.]

The Little Bittern. By H. Noll-Tobler.—With photographic illustrations of nest and young.

Ornithologische Beobachter. XIX, Heft 7. April, 1922. [In German.]

The Moor-hen (*Gallinula chloropus* L.) By A. Schifferli.

Journal für Ornithologie. 70, No. 1. January, 1922. [In German.]

Review of Saxon Ornithology. By R. Heyder.

On the Avifauna of northern German-Southwest Africa. By H. Grote. —New forms described: *Eupodotis afroides etoschae* (p. 42); *Dendropicos guineensis stresemanni* (p. 43); *Philetairus socius geminus* (p. 45); *Mirafra sabota waibeli* (p. 46).

On the Invasion of Waxwings in 1920–21. By Tschusi zu Schmidhoffen.

Yearly Review of Bird Observations at Rossitten, (1920). By J. Thienemann.

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NOTES AND NEWS

GEORGE SPENCER MORRIS, a member of the American Ornithologists' Union, died at his home "Birdfield," Olney, Philadelphia, on April 12, 1922, in the fifty-fifth year of his age. He had been in poor health for the past few years and had spent the last two winters at Miami, Fla. His friends, however, had no realization of the seriousness of his condition and his death came as a great shock.

Mr. Morris belonged to one of the oldest families of Philadelphia, identified prominently with the public affairs of the city from the time of William Penn and with the activities of the religious Society of Friends of which they were members. He was born at Olney on July 11, 1867, the son of Samuel Morris, a noted minister in the Society of Friends, and Lydia Spencer Morris, a relative of Edward Harris, the friend of Audubon. He was educated at Westtown, the famous Quaker Boarding School, which John Cassin, John K. Townsend and many other Pennsylvania naturalists had attended. Upon leaving school he became an architectural draughtsman and later established an architectural business

of his own in partnership first with Wm. S. Vaux, Jr., and later with Richard Erskine.

From early youth Mr. Morris had been deeply interested in ornithology and Audubon, from whose works he gained his first knowledge of the subject, was his ideal. Doubtless the artistic ability of the great ornithologist attracted him quite as much as his knowledge of birds, for Morris himself possessed talents in this field and became a landscape artist of ability both in oils and water colors, and was an active member as well as Vice President of the Philadelphia Sketch Club.

In 1890 he was one of the group of young men who founded the Delaware Valley Ornithological Club and were responsible for the revival of ornithological interest at the Philadelphia Academy. He served as Secretary and President of the Club, and as Councillor and Curator of the Academy, as well as Vice-Director of the Ornithological Section and member of the Lecture Committee. He became an Associate of the American Ornithologist's Union in 1887 and a Member in 1903. He was active on the Committee of Arrangements for all the Philadelphia meetings and often attended the sessions in Washington and New York, taking a deep interest in the work of the Union.

In the winter of 1889–90 he made an ornithological trip to Tampa Bay, Florida, and in 1892, accompanied Samuel N. Rhoads, a cousin by marriage, on an expedition to Puget Sound and British Columbia, but most of his bird study was carried on along the Atlantic Coast, especially at Cape Charles, Va., and Beach Haven, N. J., and in the vicinity of Philadelphia. In 1895 he visited Europe. In the same year he married Miss Lydia Ellicott, who with five children survives him.

Mr. Morris wrote well and could picture nature as skillfully with the pen as with the brush, but unfortunately he published but little, his contributions appearing mainly in 'Cassinia,' the annual of the Delaware Valley Club, in the maintainance of which he was deeply interested. A paper based on letters of Edward Harris appeared in 'The Auk' for 1895 and he contributed 'A Flood-water Cruise through a Cypress Swamp' to 'Recreation' for April 1910, and similar outdoor sketches to various smaller literary journals.

He was fond of all kinds of out door diversions, hunting, fishing, etc., but it was the beautiful in nature that most appealed to him. He enjoyed to the full canoeing trips down the wilder, less-known streams of the East, trout fishing in the roaring mountain brooks and camping in the level pine barrens of New Jersey, seeing everything with the eye of the artist as well as of the ornithologist. He was interested in all movements for social betterment, especially as they concerned boys and their interests and was a director of the Philadelphia Boy Scouts.

He had a most attractive personality, always cordial and generous, yet quiet and unassuming, earnest and helpful in every undertaking

with which he was identified and a valued friend in the truest sense of that word.—W. S.

ALFRED GRANDIDIER, of Paris, a Corresponding Fellow of the American Ornithologists' Union since 1883, and a member of the French Academy of Sciences, died Sept. 13, 1921, in the 86th year of his age. He was born Dec. 20, 1836, and was educated privately. At the age of twenty in company with his brother Ernest and in charge of M. Janssen he started on a trip around the world. After the party had gone about five months M. Janssen was compelled to return on account of ill health but the two brothers continued their journey to South America and in 1858 and 1859 explored the mining regions of Peru, Bolivia, and Chile and the passes between Santiago and Buenos Aires. An account of their collections was published in 1860 by Ernest Grandidier.

In 1863 Alfred embarked alone for India and visited Ceylon. He intended to explore the high plateau of Tibet but was prevented by a severe attack of fever and proceeded to the island of Zanzibar to recuperate. Here he remained some time, made important collections and published an account of his observations. He then visited the island of Réunion and in 1865 made his first visit to Madagascar which from that time became the chief subject of his investigations. A second voyage to Madagascar in 1866 was followed by a third in 1868, which lasted about two years and a half, when his work was interrupted by the Franco-Prussian war and he started home in 1870 never to return. During his explorations he crossed the island three times, traveled 3000 kilometers in the interior and 2500 along the coast and made about 1500 geodetic observations. These observations were utilized in the preparation of a map of the island which became the basis of all later explorations and earned for him in 1872 the gold medal of the Geographic Society.

After the war of 1870 he married Mlle. Vergé and began the preparation of his great work, 'L'Histoire politique, physique et naturelle de Madagascar.' This work undertaken in cooperation with A. Milne-Edwards, Vaillant and others, will include 39 volumes of which some 25 have been published and the others will probably be completed by his son Guillaume. The volumes treating of the birds (XII–XV), include one of text and three of plates, published under the joint authorship of Milne-Edwards and Grandidier from 1876 to 1885 and contain an exhaustive account of the avifauna of the island. His other contributions to ornithology include about half a dozen brief papers on the birds of Madagascar published between 1867 and 1872.[1]—T. S. P.

FRANK ERNEST WOODWARD, an Associate of the Union since 1919 and a well known Boston business man, died at Brookline, Mass., Aug. 5,

[1]For a more extended account of his life on which this notice is largely based, see Comptes Rendus Acad. Sci., Paris, Vol. 173, pp. 485–488. Sept. 19, 1921.

1921, from the effect of an accident in which he had been injured a few days before. He was the son of Samuel and Jerusha Baker (Erskine) Woodward and was born in Damariscotta, Maine, Jan. 2, 1853. He was a Mayflower descendant and also a descendant of Nathaniel Woodward who settled at Boston in 1633. His education was received at the Lincoln Academy at New Castle, Me., and at the Chelsea High School. At the age of 18 he entered the service of the Magee Furnace Company, became a member of the firm in 1887, and in 1905 organized the firm of Frank E. Woodward & Co., heating and ventilating engineers. Mr. Woodward took an active part in the work of patriotic and historic societies, serving as a trustee of the Malden Public Library 1903–1910, vice president and president of the Society of Mayflower Descendants, member of the Council of the New England Historic-Genealogical Society and president of the Massachusetts Society of the Sons of the Revolution. He wrote many magazine articles on genealogical and historical subjects besides publishing genealogies of the Woodward and Erskine families. —T. S. P.

Col. Basil Hicks Dutcher, U. S. A., an Associate of the Union from 1886 to 1910, died at Walter Reed Hospital, Washington, D. C., Jan. 16, 1922. He was the son of William and Catharine Price Dutcher and was born at Bergen Point, N. J., Dec. 3, 1871. He graduated from the Columbia School of Mines in 1892 and from the College of Physicians and Surgeons, New York, in 1895. At an early age he became interested in natural history and accompanied his father on many collecting trips to Long Island and other points in the vicinity of New York. At the age of 19 he was appointed a field assistant in the Division of Ornithology of the U. S. Dept. of Agriculture and took part in the biological reconnaissance of Idaho under the direction of Dr. C. Hart Merriam in 1890. In the following summer he became a member of the Death Valley Expedition and for three months was in charge of a meteorological Station in Big Cottonwood Meadows near Mt. Whitney, Calif., at an altitude of about 10,000 feet. Shortly after receiving his medical degree he secured an appointment in the army as an assistant surgeon with the rank of 1st Lieutenant and during his 25 years of service was stationed at several posts in the Southwest, in the Philippines, Porto Rico, and Panama, and during the World War he was in charge of a hospital at Brest, France. Upon his retirement from active service early in 1920 he took up his residence at Chevy Chase, Maryland, where he lived until his death. Among his natural history publications his paper on 'Bird Notes from Little Gulf Island, N. Y.,' in 'The Auk' for 1889, pp. 124–131, and his account of the 'Mammals of Mt. Katahdin, Maine,' in the Proceedings of the Biological Society of Washington for 1903, pp. 63–71, contain a number of notes of permanent value.—T. S. P.

FOLLOWING the appointment of Dr. Wilfred H. Osgood as Curator of the Department of Zoology in the Field Museum of Natural History, there has been a reorganization of the Department and a considerable increase in personnel. In the division of birds, the staff will be as follows: Dr. C. E. Hellmayr, Associate Curator; Mr. John T Zimmer, Assistant Curator; Mr. Colin C. Sanborn, Assistant; and Mr. Ashley Hine, Taxidermist. Mr. Boardman Conover, whose private collection of game birds is deposited in the Museum, is a volunteer associate. Other additions to the Department include Mr. Edmund Heller as Assistant Curator of Mammals and Mr. Karl P. Schmidt as Assistant Curator of Reptiles and Batrachians.

Dr. Hellmayr, who is an Honorary Fellow of the A. O. U., and one of the most distinguished of European ornithologists, is now at the Museum of the University of Munich, Germany He expects to arrive in America early in September and on reaching the Field Museum will devote himself largely to work connected with the completion of the series of volumes on the 'Birds of the Americas' begun by the late Charles B. Cory. His extensive knowledge of Neotropical birds especially qualifies him for this task and for other work relating to the exploration of South America which the Field Museum is now undertaking. Needless to say, all American ornithologists will welcome his accession to their ranks.

Mr. Zimmer, formerly of the University of Nebraska and more recently engaged in zoological work in the Philippines and New Guinea, joined the Museum's staff in January and left in March for extensive field work in Peru and Brazil accompanied by Mr. Heller who will collect mammals. Mr. Conover and Mr. Hine were engaged in field work during May in the vicinity of Edmonton, Alberta.

ON MARCH 14th a number of ornithologists of Washington met at the residence of Mr. B. H. Swales and organized the Baird Club. Dr. A. K. Fisher was elected president, Ned Hollister vice president, and B. H. Swales secretary. The club, named in honor of Spencer Fullerton Baird, nestor of Washington ornithologists, is an informal organization intended to promote social intercourse among its members and to discuss questions on local and general interest in ornithology.

THE 75th BIRTHDAY of Mr. John H. Sage, ex-president of the Union, on April 20, was celebrated by the Baird Club on an outing at the Washington Biologist's Field Club on Plummer Island on the Potomac at which the guests of honor were Mr. Sage, Mr. J. H. Fleming of Toronto and Dr. Casey A. Wood who had just returned from British Guiana. Two days later Dr. Wood gave an informal dinner at the Cosmos Club in honor of Mr. Sage which was attended by 15 local ornithologists and several guests.

AN UNUSUAL number of members of the Union are abroad this summer Dr. Jonathan Dwight and Dr. Casey A. Wood are spending the summer in England, Mr. T. Gilbert Pearson sailed early in May for a brief trip to France, Holland and England, Mrs. V. M. Reichenberger is doing some special work in Munich, Dr. F. M. Chapman left for South America to June to resume field work in Ecuador, and Mr. Rollo H. Beck is still collecting in the South Pacific for the American Museum of Natural History, and Dr. Leonhard Stejneger expects to revisit the Commander Islands, Siberia, in connection with a trip to Alaska. Mr. Henry W. Fowler will leave shortly for a year's stay in Honolulu and vicinity and Dr. Wm. E. Hughes is on his way to the Feejee Islands.

THE annual meeting of the American Ornithologists' Union for 1922, being the fortieth stated meeting, will be held in Chicago, Illinois, the week beginning October 23. The public sessions will be held October 24, 25, and 26 in the magnificent new building of the Field Museum of Natural History situated in Grant Park on the shore of Lake Michigan within sight and walking distance of the business district and many of the best hotels.

Since this will be the first stated meeting of the Union to be held in the Mississippi Valley, it is hoped that it may be widely representative of the whole country with a good attendance from both east and west. The usual participants at eastern meetings, including the well known ornithologists of New York, Boston, Philadelphia and Washington, will be well represented and it will be a particularly happy occasion if a good delegation is present from the numerous active ornithologists of the Pacific Coast. From Chicago itself and from the states of the Middle West and South a large attendance is confidently expected.

Chicago is a favorite convention city and will provide ample entertainments and social features. Plans will include an excursion to the interesting sand dune region of Indiana some forty miles southeast of Chicago and shorter excursions will be optional. It is proposed also to hold an exhibition of bird painting following the example so successfully set at the Washington meeting in 1918. This feature will be especially developed and doubtless will be greatly appreciated by those who have not previously had opportunity to see a large and varied collection of original paintings of birds. Besides pictures to be exhibited by the artists themselves, it is hoped that pictures owned by various members of the Union will be loaned for the occasion under terms which will entail no expense or risk to the owners. Correspondence in regard to this is invited by the Chairman of the local committee.

The committee of arrangements consists of Wilfred H. Osgood (chairman), Percival B. Coffin, Ruthven Deane, O. N. Schantz, and R. M. Strong. together with the President and Secretary of the A. O. U., ex-officio.

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A STUDY OF THE NESTING OF MOURNING DOVES.

BY MARGARET MORSE NICE.*

Plate XVIII.

THE campus of the University of Oklahoma is a particularly favorable place for the study of the nesting of the Western Mourning Dove (*Zenaidura macroura marginella*), for great numbers of this bird breed here. In August and September 1919, we found 37 nests, during the season of 1920 we located 124 nests, and in April, May and September 1921, 122. This study deals not with intensive observation of individual birds, but with statistics on these nests, the numbers of which were large enough to enable us to make averages and draw some general conclusions.

Norman is situated almost in the center of Oklahoma, its elevation is 1170 feet, and the yearly rainfall varies from 30 to 35 inches. The country is level prairie, now largely under cultivation, and almost the only indigenous trees grow along the creek beds. Both the town and the campus of the University have been liberally planted with trees, mostly elms and locusts, few of which are older than

*I wish to acknowledge my indebtedness to my husband, Dr. L. B. Nice, who went on many searches for Dove nests and to my daughter, Constance, who, with her unquenchable zeal for climbing the trees, was of indispensable assistance to me.

25 years, and most are younger. The Mourning Doves evidently prefer the grove environment of the campus to the same kind and sizes of trees on the streets of the town, for, although we have been on the lookout for nests of these birds wherever we have been, in 1919, 89 per cent of all nests seen were on the University grounds, and in both 1920 and 1921, 92 per cent were in this situation.

In order to avoid confusion among so many nests, I gradually evolved an elaborate system of records depending on a map of the campus, 10.5 × 14 inches in size, and a large notebook. I divided the campus into 26 divisions, each being designated by a letter; then on the map I marked the location of each nest by a number, using a new map each month and sometimes oftener. The notebook was divided into squares with columns for the number of the nest, its location on the campus, the kind of tree, height from the ground, position in a crotch or on a branch, and any peculiarity of the nest or parents. The rest of the columns were headed by the dates and hours of visit, and under each date it was noted whether the parent was brooding, the contents of the nest, if examined, behavior of the parents, size and position of the young, etc., or the fact of the destruction of the nest.

1. THE NEST.

Building the Nest. Nest building as a rule takes place in the early morning. The male Mourning Dove gathers the materials and carries them to his mate who arranges them. He takes one piece at a time, and if he happens to drop it, he does not stop but continues his journey to the tree and then starts over again. Dr. Chas. Whitman[1] says: "All pigeons, so far as I know, carry but *one straw* at a time; the sparrow, on the other hand, loads itself up with as many pieces as it can hold in its mouth, and thus saves trips to the nest. * * * In this simple difference of method we see a wide difference in intelligence." This laborious practice of one straw at a time is probably one reason why Doves' nests are such poor affairs.

[1] Behavior of Pigeons III, 1919, p. 22.

Material. The nests of Mourning Doves are notoriously frail structures, being simple platforms of dead grass, weeds, etc., and a few twigs. In three or four instances only, have the nests here in Norman been so scanty that the eggs could be seen through the bottom.

I examined the materials in three typical nests that had been deserted. Nest 7, found deserted April 23, 1921, with one punctured egg in it, was situated in a crotch of an elm 12 feet from the ground. The materials consisted of 6 twigs from 1 to 6 inches long and 148 pieces of dried grass, 4 of which were from 15 to 18 inches long, 33 from 8 to 6 inches, 27 about 6 inches and 84 were smaller.

Nest 33, on May 4, contained two eggs, while on May 9 it was empty. It was in a crotch of an elm on a very old Robin's nest, 12 feet from the ground. The materials were 3 twigs, 1 to 2 inches long, 10 weed stems, 4 to 10 inches long, and 145 pieces of dried grass, 3 of which were about 12 inches long, 28 varied from 6 to 10 inches, 34 were about 4 inches long and 80 were smaller.

Nest 41 was in process of construction May 9; contained two small young May 26, but was empty the next day. It was situated on the branch of an elm 10 feet from the ground. It was more substantial than the others and was made of 3 twigs about 8 inches long, 1 tiny twig, 40 pieces of dried grass stems and grass roots, 20 wild geranium stems, 40 pepper-grass stems and 31 little pieces of weed and grass—135 pieces in all.

Many of the smallest pieces were doubtless fragments of the original materials gathered, although the first two nests had not been used for long. If we assume that these smallest pieces represent two or three times as many pieces as were carried to the nest, we would have from 87 to 115 pieces carried to the first two nests, that were placed in crotches and from 115 to 120 to the last nest that was in a more exposed situation.

Trees Chosen. In 1919, we found 22 Dove nests in elms, 10 in locusts, 4 in osage orange, one in a box elder and one in a walnut; in 1920 there were 68 Dove nests in elms, 25 in locusts, 14 in osage orange, 4 in apples, 3 each in cedars and box elders, 2 in walnuts and one in a maple. In 1921 there were 79 in elms, 10 in locusts, 16 in osage orange, 3 each in maples and walnuts, 2 each in elder

and Russian mulberry, and one each in an apple and pine. The Doves seem to have nested about equally in all kinds of trees in proportion to their number except that silver maples (*Acer saccharinum*) of which there are many on the campus, are evidently not liked. Cottonwoods are avoided entirely so far as our experience goes. In 1921 the Doves utilized elms more and locusts less than the year before, which was probably due to a late frost that killed the locust buds and delayed their leafing out for nearly a month. (In 1920 the first nest in a locust was found April 18, but in 1921 none was seen until May 3, at which time these trees were in fairly full leaf.)

Height of Nests. Only twice in Norman have we found Dove nests on the ground. One of these was located in a corn field in June 1917, while the other, which was on the campus, contained eggs June 8, 1919.

The following table gives the numbers and percentages of nests found on the campus in 1920 and 1921 at different heights.

TABLE I.

HEIGHT OF MOURNING DOVE NESTS FROM THE GROUND.

	1920		1921	
Height in feet	Number of Nests	Per Cent	Number of Nests	Per Cent
3–6	12	9.9	0	0
8–10	31	25.4	36	30.4
12–20	72	59.0	80	68.0
25–30	7	5.7	2	1.6
	122	100.0	118	100.0

In both years about a third of the nests were placed at 10 feet or lower, and about two-thirds from 12 to 20 feet. In 1920 there was more variation than in 1921, more very low and very high nests. The average of the two years is nearly the same, 13.3 feet for 1920 and 14 feet for 1921.

Position of the Nests. Horizontal branches are more in favor with Mourning Doves for placing their nests than are the crotches of trees. The numbers that chose each position in 1920 and 1921 are shown in Table II.

TABLE II.

POSITION OF MOURNING DOVE NESTS.

	Branch		Crotch	
Year	Numbers	Per Cent.	Numbers	Per Cent
1920	71	65.1	38	34.9
1921	75	63.6	43	36.4

In both years about two-thirds of the nests were found on branches and one third in crotches. Yet in early spring a different relationship is shown; in April 1921 there were nearly as many crotch nests as branch nests—12 in the former and 15 of the latter, while the year before in April there were even more in crotches—15 nests—with only 12 on branches.

This would look as if the Doves sought protection in crotches when the leaves were small. Perhaps a shortage of suitable crotches may have something to do with the matter. Undoubtedly there are not enough to go around in the height of the nesting season; but in July, August and September 1920, when few Doves were nesting, only one-fifth of the 30 nests found were in crotches and in September 1921, all four nests seen were on branches. This choice of sites in late summer and fall lends support to the theory that desire for protection is the reason that crotches are preferred in April.

That the Doves are not wise in their preference for horizontal branches rather than crotches is shown in Table III.

TABLE III.

SUCCESSES* AND FAILURES IN RELATION TO POSITION.

	Branch Nests				Crotch Nests			
	Number		Per Cent.		Number		Per Cent.	
	Successes	Failures	Successes	Failures	Successes	Failures	Successes	Failures
1920	6	16	27 3	72 7	8	12	40 0	60 0
1921	11	26	29 7	70 3	13	6	68 4	31 6
Total	17	42	28.8	71 2	21	18	53 8	46.2

* We knew the outcome of nearly half the nests found. We counted as "successes" those nests that contained young large enough to fly when last inspected.

On an average the crotch nests are almost twice as successful as those on branches, for slightly more than a fourth of the latter succeeded, while a little more than half of the former did. It is interesting how the Doves persist in preferring the less safe position.

The Use of Other Nests. Mourning Doves sometimes save themselves trouble by utilizing the nests of other birds. (In all but one of our cases, which was a new Robin's nest containing one Robin's egg, the doves had added more or less material of their own.) In 1920, twelve used old Brown Thrashers' or Mockingbirds' nests, three Robins', two English Sparrows', one a Bronzed Grackle's and two old Doves' nests; in 1921, there were eight old Thrashers' nests used, five old Robins', three new Robin's and two old Doves'. Table IV shows the numbers of these nests and the percentage they form of all the nests found in 1920 and 1921; the numbers of these nests that were built in April and finally the successes and failures of these nests so far as they were known.

TABLE IV.

MOURNING DOVE NESTS BUILT ON OTHERS.

Year	Number of Nests	Per cent of total nests	Number in April	Successes	Failures
1920	20	15.4	13	2	10
1921	18	15.1	12	8	4

There is a surprising uniformity in the two years in the number of nests built on top of others—fifteen per cent each year. In 1920 thirteen of these nests were found in April, one in May, four in June, and two in September, while in 1921 twelve were found in April, three in May and three in September (we were not here during the summer).

Thus two-thirds of these nests occurred in April in both years. Here again would seem to be evidence of adaptation for greater protection in early spring.* In 1921 it worked out this way for two-thirds of the nests built on others were known to have succeeded while only one-third of the others did.

* It is possible that last year's Doves like to utilize these nests of other birds for their first attempts at nest building but with increasing experience grow more independent later in the season.

But in 1920 the results are just the opposite for then only one-sixth of the nests placed on others were known to have succeeded, while the same proportion as in 1921—one-third of the others did. An explanation of this lies in the fact of most of the nests on top of others being built in April, for the fatalities in that month were far greater than later in the season, due apparently to storms. These nests were neither better nor worse off than the others.

The chief advantage of building on another nest lies in a larger, stronger place for holding the young Apparently there was no advantage when it came to weathering a long cold rain. Of the two successful nests on top of others in 1920, one raised one bird and the other raised two, and in 1921 all eight raised their full quota, which was even *three* in one case, and of the sixteen other successful nests nine raised only one bird apiece. (However three of these half broods were not due to frailty of the nests, two eggs being infertile, and one egg being knocked to the ground by the parent as he was frightened off the nest—the only case of such injury that occurred with us.)

Thus in 1920 no advantage accrued to the Doves that built their nests on top of others, but in 1921 these nests were decidedly more successful, both as to percentages of nests succeeding and to numbers of young raised.

Sometimes a Dove's nest is used again the same season; we have noted five instances of this. In 1919 a nest on August 16 contained one young bird and on August 26 two eggs. In 1920, one brood was observed to be in possession of a nest from April 22 to May 17, and on June 5 it was again occupied; the other nest was in use May 13 and 19, but was empty May 31, on June 16 a parent was again incubating. In 1921 one nest was used throughout April and was empty May 4, on May 25 a parent was incubating. In the other, one young bird left the nest May 3 or 4, and on the 29th a parent was in possession. The natural assumption is that the nest is used again by the pair of birds that built it, but we do not know whether this is true. Dr. Whitman[1] found a decided tendency among all his pigeons to select a new site for each nest.

[1] Loc. cit. III. p. 21.

It may be that other Doves utilize these old nests of their kind just as they do those of other birds.

Occasionally Doves make surprising choices of nests to build on: squirrel's nests are reported by two observers[3] [4] but one of the most unexpected is the use of a Baltimore Oriole's nest which was found in Kansas by Mr. A. J. Kirn.

This habit of using nests of other birds occasionally results in Doves incubating eggs of other species. Mr. F. Graham[5] reports of two Mourning Dove's eggs and three Boat-tailed Grackle's in a Grackle nest; Mr. J. R. Pemberton[6] tells of a Dove incubating two Brown Thrasher eggs as well as her own two in a Thrasher nest; while Mr. J. L. Davison[7] found a partly built Robin nest that had been finished by a Yellow-billed Cuckoo, and which contained one Robin egg, two Cuckoo eggs and two Mourning Dove eggs, the two latter birds being on the nest. What a pity this unique family was not left to develop!

Because of the Dove's method of feeding young it seems impossible that any young passerine bird that happened to hatch in a Dove nest could survive. Cowbird's eggs have been reported in Mourning Dove nests by two authors[8] [9]. We were hoping to watch developments in two nests with alien eggs this spring. The first case was a Robin's nest found April 15, with one Robin's egg in it; on April 23 a Dove was in possession and the nest contained two Dove eggs and one Robin's. On April 26 the situation was unchanged, but on the 28th, to our disappointment, the Robin's egg lay broken on the ground. The Dove's eggs hatched May 4, and the birds left May 19.

The other instance was an experiment we made by placing a Cowbird's egg, taken from a Cardinal's nest, in a Dove's nest that contained one egg on April 26. On April 30 the nest contained two Dove eggs and the Cowbird egg, but on May 4 and 5, only one Dove egg beside the Cowbird egg, and on the 9th, the nest was

[3] Stoner, E. A. Oologist, XXXII. 1915. p. 76.

[4] Kirn A. J. In a letter. Texas, April, 1920.

[5] Oölogist, XXXII. 1915, p. 211.

[6] Condor, XXIII. 1921, p. 133.

[7] Auk, IV. 1887, p. 264.

[8] Coues, E., Auk. I. 1884, p. 293.

[9] Bendire, C., Smithsonian Rep. 1893. pp. 587–624.

empty. We hope to carry out this experiment with a Cowbird egg another year. In these two cases it looks as if the Doves did not wish to have more than two eggs in the nest as in each case one disappeared and in the case of the Robin's nest it was impossible for it to roll out. However, in two other nests found in 1921 three Dove eggs were incubated and hatched.

2. THE EGGS.

Incubation period. Dr. Witman[10] found that the time of laying of the first egg of captive Mourning Doves occurred between 4 and 6 P. M., while in six cases the second egg was laid early in the morning of the second day after from 6.30 to 9.00 A. M. The incubation period was found by him by observation on eleven sets[11] of eggs to be 14½ to 15½ days for the first egg and 14 1/8 and 14 7/8 for the second. Dr. Whitman[12] noted that in the case of all his pigeons the young birds usually hatched early in the morning or between 10 A. M. and noon. "If the egg does not hatch by 3 P. M. one can be fairly certain that nothing will be done until next morning. It may be fully time for the bird to hatch, but for some reason the hatching is not completed, and the bird *goes to sleep*, apparently rests, and then wakes up very early with the rest of the birds in the morning and concludes the hatch."

As a rule one or the other parent is continuously on the nest from the time the first egg is laid until the young are fairly well grown. Dr. Wallace Craig[13] says, "Male and female take regular turns in sitting on the eggs or young: the female sits from evening till morning, the male from morning till evening, the exchanges taking place usually about 8.30 A. M. and 4.30 P. M." As Mourning Doves will not come to their nests if they see a person any where near, I have witnessed this exchange only when I was concealed from view. On May 11, 1921, a female was relieved by her mate at 8.17 A. M., and on September 22, a male left the nest upon the return of the female at 4.25 P. M.

[10] Loc. cit. III. p. 45.
[11] Loc. cit. III. p. 42.
[12] Loc. cit. III. p. 50.
[13] Auk, XXVIII. 1911. p. 406.

The Number of Eggs. The number of eggs in a set is almost always two, but one, three and four eggs in a nest have been reported.

Dr. Whitman's[14] Mourning Doves in two cases laid only one egg. Mr. J. G. Tyler[15] found a heavily incubated egg of this species in an old nest of a Mockingbird, "the unusual depth of the nest seeming" to preclude the possibility of an egg having rolled out. Capt. Bendire[16] and Prof. Wm. S. Taylor[17] say that "sometimes only one" is laid, while Mr. W. F. Henninger[18] says this "frequently happens."

Sets of four eggs have been reported a number of times. In five such cases[19-22] no details are given. The four found in a Yellow-billed Cuckoo's nest by Messrs L. B. and L. I. Evans[24] were all equally incubated. Mr. A. F. Ganier[25] stated that "only one pair of birds was in evidence" at his nest with "four perfectly fresh eggs." Dr. Lynds Jones[26] reported that his set of four "was pretty clearly occupied by two females amd one male." In a letter he says: "The eggs were paired both as to size and shape, and degree of incubation. Two of them (which were alike in shape and size) were well advanced in incubation, while the other two were slightly addled."

I have found reports of over 40 cases of three eggs in a nest; most of the finders give no details as to appearance or stage of incubation of the eggs. Eleven[27-37] report single cases only. Two

[14] Loc. cit. III. p. 43.
[15] Pac. Coast Avifauna 9, 1918. p. 37.
[16] Life Histories of North American Birds, I, 1892, p. 142.
[17] The Mourning Dove. Bull. Univ. Texas, No. 57, 1916. p. 6.
[18] Wilson Bulletin, IX, 1902. p. 138.
[19] Barnes, R. M. Oölogist, XXX. 1913, p. 148.
[20] Duprey, H. F. Oölogist, XXX. 1913. p. 148.
[21] Gainer, A. F. In a letter; set found by friend at Nashville.
[22] Harris H. Birds of Kansas City Region, 1919, p. 258. Also in a letter.
[23] Shepardson, D. I. Oölogist, XXVI, 1909. p. 153.
[24] Oölogist XXXI. 1914. p. 80. Also in a letter.
[25] The Hummer. Aug. 1899.
[26] Wilson Bulletin XXXI, 1909, p 190.
[27] Barnes, R. M. Loc. cit.
[28] Beard, T. R. In a letter.
[29] Densmore, R. Oölogist, XXX. p. 16.
[30] Evermann, B. W. Auk, V. 1885; p. 351; also Proc. Ind. Acad. Sci. 1920, p. 37.
[31] Graham, F. Oölogist, XXXII. 1915, p. 211.
[32] Graves, E. W. Oölogist, XXVI, p. 56.
[33] Grinnell, J., Bryant, H. C. and Storer, T. I. Game birds of California. 1918, p. 595.
[34] Harris, H. Loc.cit. Also in a letter.

such sets are illustrated.[35–39] Three men[40–42] have found two instances of these sets, Mr. H. C. Little[42] reports "several," Mr. H. P. Attwater writes that on "two or three occasions" he has come across such sets and Mr. L. B. Evans writes that a neighbor has found two or three. Mr. Wm. S. Taylor states in a letter that he has found three such sets, while the Evans brothers have found as many as six sets in Kansas, all of these occurring in May.

Of the men who do describe their sets, only one[44] says the size and shape of the eggs were about the same. In six sets[45–48] differences in size are mentioned; in four, one egg was smaller than the others, in one it was larger, and in the other, two were smaller and one the usual size. Mr. J. G. Tyler[48] describes the third egg as "somewhat smaller, more pointed, and of a shade so unlike the others that there appeared to be a difference in shell texture."

In three cases there was a marked difference in the stage of incubation of the eggs, Mr. F. Stephens[49] reporting that in "two incubation had commenced, the third was fresh," Mr. A. S. Pearse[50] finding that two "were hardly incubated while the other was perfectly fresh" and Mr. J. W. Jacobs[51] stating that "two of the eggs were pipped" while "the third was perfectly fresh and to all appearances fertile."

We have found three nests[52] that contained more than the normal set. The first was seen May 25, 1917, when it contained two small squabs and one egg; unfortunately as we were not particularly interested in Mourning Doves at that time, we did not revisit this nest. The other two cases were found in the spring

[35] Simmons, G. F. Auk, XXXII. 1915, p. 322.
[36] Stoner, E. A. Oölogist, XXXII. 1915, p. 76.
[37] Westbrook, D. C. Oölogist, XXX. 1913, p. 51.
[38] Hundley, C. O. 4th. Rep. Forest, Game & Fish Warden, W. Va. 1916, p. 130.
[39] Ritenbergh, J. Oölogist, XXIV. 1907, p. 9.
[40] Doolittle, E. A. Auk, XXXVI. 1919, p. 281.
[41] Hartrauft, C. W. Oölogist, XXV. p. 85–7.
[42] Jones, L. Loc. cit. Also in a letter.
[43] Oölogist, II, 1885, p. 39.
[44] Semmes, T., Jr. Oölogist, XXIV. 1907, p. 8.
[45] Evans, L. B. 3 sets; in a letter.
[46] B., W. D. L. Oölogist, VI, 1889, p. 193.
[47] Hutchinson, W. C. Oölogist, VI. 1889, p. 176.
[48] Tyler, J. G. Loc. cit. p. 36.
[49] Cited by Bendire. Loc. cit. 1892, p. 142.
[50] Wilson Bulletin, IV. 1897, p. 63.
[51] Wilson Bulletin, IV. 1897, p. 71.
[52] Nice, M. M. Condor, XXIII. 1921, pp. 145–7.

of 1921; in one, Nest 20, one egg was slightly smaller than the other two, but the three hatched just one day apart. In the other, Nest 29, the third egg looked somewhat yellowish, and it hatched five and six days after the other two. So in two of our cases there was a difference in appearance of the eggs, and in two a difference in the age.

The question arises as to whether Mourning Doves lay three and four eggs in a clutch. I think we are on safe ground in assuming that when four eggs are found in one nest they are the product of two females. Whether such cases always or usually mean polygamy we have no means of knowing at present.

As to the matter of three eggs, I asked the opinion of two men who have made a special study of the life history of pigeons, Dr. Wallace Craig and Dr. Oscar Riddle.

Dr. Craig wrote: "The question is partly a physiological one, as to whether it would be possible for a female Dove to lay three eggs in one set. As to the question of behavior, I suppose it possible that a female might lay in another's nest. Or I suppose it possible that two females might form a homosexual union, as they sometimes do in captivity."

Dr. Riddle answered my question as follows: "I very much doubt that Mourning Doves ever lay three eggs in a clutch. It seems to me probable that where three Mourning Dove eggs are found in one nest they have one of the two following origins.

"(1) The same female has laid eggs or an egg, and while incubating has again laid in the same nest. (We have a very few ring-doves who do this.)

"(2) The eggs are laid by two different Mourning Doves. If the latter happens, one conjecture would be that the same male had mated temporarily or otherwise with the two females. We have observed considerable lapses of fidelity of male doves to their mates."

Still another possibility in some cases might be the adoption of a deserted Dove's nest which contained an egg.

Before leaving the consideration of three eggs in a nest, let us turn to the cases where three young have been found. Besides our two instances, I can find four others[53-55] only one of which[55]

[53] Fisher, A. K. No. Amer. Fauna, No. 7, 1893, p. 33.

is in any way described: in this case the three young were "all of one size." Most of the finders of three eggs in a nest seem to have collected these unusual sets or not to have revisited them. Prof. Wm. S. Taylor, however, did return to those he found and in a letter he says that in each of the three cases "when I visited the nest after the birds had hatched out I found two birds, and no trace of the third egg. Each of these nests was built on the flat surface of a rail in a rail fence, the bird using a flat depression in the rail for its nest. All of these nests were in Kentucky."

In the cases we found in 1921, we were able to trace the history of the nests from the egg stage to the time the young left and at neither nest was there ever more than one pair of birds in evidence. The first of these three eggs sets (Nest 20) was found in a new Rob-n's nest on April 30; the eggs hatched May 13, 14, and 15. The birds developed rapidly so far as feather development went, but on May 19, upon weighing them, we found that the two younger were smaller than others of their age; the five-day-old weighing 21.8 grams, and the four-day-old 17 grams, the average of two other five-day-old birds being 36 grams, and of two four-day-olds 30.5 grams. It would thus appear as if the three were not getting quite enough food, yet, although we did not disturb them after May 21, they left the nest at the average age for Doves here, when 13, 13 and 12 days old respectively.

The other nest (No. 29) was a fairly substantial one in a crotch of an elm; on May 3, it contained two eggs and on May 9, three. These eggs hatched May 16, 17 and 22, on the last of which dates the birds weighed respectively 40.3 grams, 37.8 grams and 4.4 grams. The belated squab could not compete for food with its large nest-mates. The next day it had only gained four-tenths of a gram, and the day after it was dead. The others left the nest when 12 and 13 days old.

These two nests are of particular interest in that their history and outcome were different. The raising of three birds to maturity in Nest 20 was dependent on two favoring circumstances, the roominess and depth of the new Robin's nest used, and the fact

[14] Semmes, T. Jr., Loc. cit. Two cases.

[15] Wharram, S. K. Oölogist, XXXII, p. 134.

that the birds differed only a day in age. In Nest 29, the hatching of the last bird five and six days after its nest mates made its survival impossible, as the others were eight and nine times its size, and it would be hopeless for it to expect enough food. Moreover if the three had hatched only a day apart the nest could not have held them when they were half grown. So here we have two possible explanations of the rarity of three young Mourning Doves being found in one nest: first, the ordinary Dove nest is incapable of holding three young birds to maturity, and secondly, the third bird may hatch so late that it cannot compete for nourishment with its large nest mates.

3. The Young.

Growth. There is almost always a difference in size in a pair of Mourning Dove squabs, due to their usually hatching one or two days apart. In our experience, in six nests the young hatched on succeeding days, in two nests two days apart and in another on the same day. With Dr. Whitman's[56] captive Mourning Doves one set hatched two days apart, two sets on the same day and nine on succeeding days.

In May 1921, we weighed the nestlings in one nest from the day they hatched to the age of eight and nine days, we weighed two other young for four successive days and have single weights of five other squabs of whose age we are certain. Table V. gives the weights of six young Mourning Doves. (Unfortunately these birds were not always weighed at the same time each day.)

Table V.

Daily Weights in Grams of Young Mourning Doves.

When Hatched	1 day	2 days	3 days	4 days	5 days	6 days	7 days	8 days	9 days	10 days	11 days	
29 a	8.1	10.2	15.3	22.2	28.8	34.3	40.3	44.1	52.2	55.8		
29 b	6.2	11.5	19.0	23.5	32.2	37.8	44.4	52.1	56.3			
25 a									62.3	69.8	71.0	77.6
25 b							45.0	49.7	53.0	55.0		
48									57.7			
20 a							41.0	43.0				
Aver.	7.2	10.8	17.2	22.8	30.5	36.1	42.7	47.2	56.3	60.2	71.0	77.6
Daily Gain		3.6	6.7	5.6	7.7	5.6	6.6	4.5	9.1	3.9	10.8	6.6

[56] Loc. cit. III, p. 51.

We never weighed a young bird before it had been fed, except, perhaps in the case of the third squab in Nest 29, which weighed 4.4 grams. An infertile egg weighed 5.2 grams.

The rapid growth of these birds is apparent; 29b increasing its weight nine times by the eighth day, while the average of all the birds increased eleven times by the eleventh day.

There was considerable individual difference in the birds; 29b growing faster than 29a, so that when the former was seven days old it weighed slightly more than its eight day nest mate. On the other hand 25a was decidedly ahead of its nest mate even at the same ages. Here there was a two days difference in age and the older one apparently got more than its share of food. No. 48 was alone in the nest but did not weigh quite so much as 25a at the age of eight days. No. 20a was the oldest in a nest of three; and is slightly below average weight, but there is no marked difference as with the younger birds. No. 20b weighed only 21.8 and 26 grams at five and six days, and 20c weighed 17 grams at four days.

I kept a few notes on the most striking phases of feather development.

First hatched: covered with white down, blind.

One day old: appearance the same, but squab is larger.

Two days old: pin feathers of wings appear; eyes open a little.

Three days old: eyes open wider.

Four days old: pin feathers of tail appear.

Five days old: in two birds wing feathers have begun to unsheath, but in two birds they have not.

Six days old: wing feathers unsheathed in all four birds; tail feathers begin to unsheath in two.

Seven days old: tail feathers more or less unsheathed in all the birds.

Eight days old: pin feathers of head unsheath.

Feeding. Young Mourning Doves are fed "pigeon milk," which is regurgitated by both parents, the young putting their bills inside that of the parent. When they are small the parent feeds both at the same time, pumping the food up by a bowing motion.

How long young Doves are fed after they leave the nest I do not know. A young bird we had in captivity[57] still begged franti-

[57] Nice, M. M. Proc. Okla. Acad. Sci. I. 1921, pp. 57–65.

cally from an older Dove at the age of four weeks; after this I never saw him do it. Perhaps he would have persisted longer if he had been rewarded with food instead of cruel pecks.

Position in Nest. Mr. F. C. Willard[58] says of young Mourning Doves in Arizona that they "always face in the same direction." Miss Althea Sherman[59] showed that this was not true in Iowa, the earliest date at which she reports young Doves as facing in opposite directions occurring when the oldest was six days old. Our experience has been that the more usual position is for squabs to face in the same direction, but that near the end of nest life they often face in opposite directions.

At first the young face the tail of the parent; the oldest birds in which we noted this position were eight and nine days old. Later they are more apt to face in the same direction as the parent.

Length of time the young are brooded. Mourning Doves usually brood their young almost constantly up to the age of about ten days; after this the squabs are apt to be left alone more or less.* In 26 cases parents were seen brooding with large young and where the age was known it varied from ten to thirteen days. In five of these cases the young flew out when disturbed. Two broods were replaced, one of which was noted unbrooded in the nest two days later, but in the other three cases the birds left for good and were thus brooded till the very end of the nest life. (With such large birds, the parent usually sits beside them.) In nine of the 26 cases, the parents did not brood constantly till the very end of the nest life, and seven other broods of large young were seen with no parent on the nest.

A few cases in which the ages of the young are known will be given. Nest 25: young brooded when 10 and 12 days old; but parent not seen when young were 11 and 13 days old; young left the nest next day. Nest 29: young brooded when 10 and 11 days, but parent not seen when young were 11 and 12 days old; young left the next day. Nest 1: young brooded till 10 and 11 days old

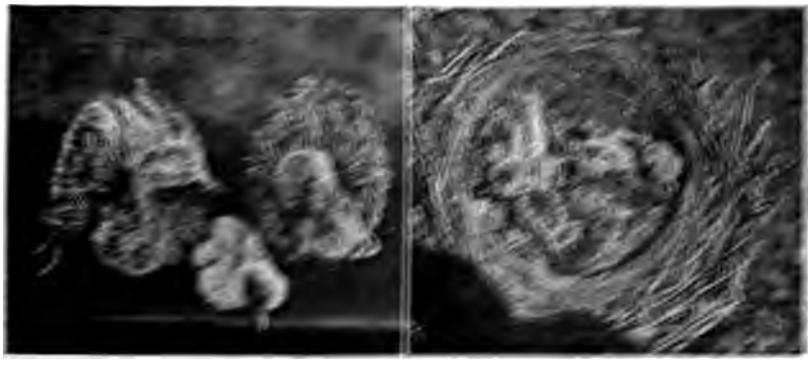
[58] Condor, XIV. 1912, p. 59.

[59] Condor, XIV. 1912. p. 153.

* Practically all our data are based on single visits, so if we recorded a nest unbrooded or brooded at one time, it would not necessarily be true of the whole day.







at least, but parents not seen when young were 13, 14 and 15 days old. Nest 118: young brooded till 4.25 P. M. by male when 8 and 9 days old; female waited in the tree one-half hour before she came to the nest; no parent seen when nest was visited, when the young were 12 to 14 days old.

The earliest age at which we have found young left unbrooded was four and five days. On September 23, 1919, in nest A the male was on the nest at 4 P. M. No parent was there at 5 P. M. although the female was near, but at 7.30 P. M. she was on. On September 27 the young were not brooded at 7.15 P. M., but at 7.45 the female was on. Another brood—V—of young that hatched on the same days as brood A, was found with no parent on or near at 5 P. M. September 23, although the female was brooding at 7.30 P. M. These two nests were exceptional as we have never found any other nestlings unbrooded for even a short while under the age of ten days, except Nest 118, for half an hour when the young were eight and nine days old. The weather was not warm; the maximum and minimum on September 23 being 73° and 53° and on the 27, 85° and 65°. And although the parents of one nest—V—showed themselves later to be indifferent to the fate of their young, those of the other proved themselves especially devoted.

Length of time the young stay in the nest. Mr. E. W. Gifford,[60] with captive Mourning Doves in California, found that two young birds in different broods left the nest at the end of twelve days. Mr. Frank L. Burns[61] gives the period of nestling life of this species, as ten to twelve days; basing his statement on his own experience in Pennsylvania and on that of Mr. C. H. Rogers in New Jersey. In contrast to these short periods, Miss Sherman[62] described a brood that did not leave till 17 and 18 days old. In answer to my question about these birds she wrote, "I have no theory why this brood staid in the nest longer than the average *here* which is at least fifteen days."

We know the ages at which 16 young Mourning Doves left the nest of their own accord in 1921.

[60] Condor XI, 1909, p. 85.
[61] Wilson Bulletin, XXXIII, 1921, p. 96.
[62] Loc. cit.

TABLE VI.

AGE AT WHICH MOURNING DOVES LEFT THE NEST.

Nest	Date of Leaving	Number in Brood	Age in Days
1	Apr. 19 & 20	2	15
11	May 19	2	15
34	May 23 & 25	2	13
20	May 26 & 27	3	13, 13 & 12
48	May 27	1	12
25	May 28	2	12 & 14
29	May 29	2	12 & 13
118	Sept. 27	2	13 & 14

Four birds left at 15 days, two at 14, six at 13 and four at 12, making an average of 13.4 days. The average age of the 12 birds leaving after May 23, is just 13 days. The young in the two earliest nests staid longer than those later—15 days—whereas no later birds staid longer than 14 days.

Young Mourning Doves are easily frightened out prematurely. The earliest age at which we have found this to occur was eight days—the squab in Nest 48. It was replaced and left of its own accord four days later. In Nest 25 the older bird was frightened off the nest when 11 days old but was put back and did not leave permanently until it was 14 days old.

Norman, Oklahoma.

(*To be concluded*)

AN ARIZONA FEEDING TABLE.

BY FLORENCE MERRIAM BAILEY.

A FLOCK of Gambel's Sparrows with their handsome black-and-white striped crowns, spending the winter of 1920–21 like ourselves among the mesquites at the foot of the Santa Rita Mountains in southern Arizona, made a bird table seem important; for if they were kept around our tent during the winter, what other interesting migrants might they not tempt to stop in passing during the spring. They were quick to respond to our hospitality, and for five months, during which they were fed daily, made our

camp their headquarters, the younger ones with the brown-striped crowns becoming so tame that they paid little heed to us, some of them even venturing into the tent for food. While the deliberate, plaintive summer song one hears from individual Gambel's Sparrows in the mountains was rarely heard, the bright, cheery winter chorus of the flock made a delightful accompaniment to the work of the day.

The feeding table was hung in a mesquite too high to be reached by dogs and cats, and yet not too high to be seen from inside the tent when the flap was raised, just low enough in fact for photographs to be attempted from inside, by means of a long string attached to the camera standing outside focused on the table. Unfortunately, however, as the most interesting migrants came with the leaves, the filtered sunshine proved too weak for successful photography.

During the winter the ice frequently had to be broken in the water pan in the morning, and during a memorable April snowstorm the snow had to be scraped off before the food could be put out. The principal foods used were rolled oats, wheat, and mixed chicken feed—weed seed, wheat, barley, rye, kaffir corn, and cracked corn, the cracked corn proving decidedly unpopular. The other seeds were eaten not only by the Sparrows but by the Towhees and Cardinals.

The big fluffy Canyon Towhees, whose gray plumage was touched up by their brown caps, were really the first discoverers of the feeding table but, when the merry troop of Gambel's Sparrows found it and took possession of both the table and the thicket behind it, the quiet Towhees withdrew, contenting themselves with slipping in when the others were temporarily away, or with humbly picking up the crumbs which fell from the crowded table.

A pair of Arizona Cardinals, the male a superb bird, with his vivid red plumage and long nodding crest, were regular habitues of the table. At first they seemed particularly attracted by a cup-shaped section of squash rind kept filled with seed, but soon made themselves at home on the table. The actions of the timid female were an amusing contrast to those of the lordly male. For a long time she was painfully shy in the presence of the flock, usually flying off soon after they appeared, but after three months

association with them she was seen actually making a pass at a usurper.

A small water cup nailed to the tree by the table was frequented for a time by a Ruby-crowned Kinglet whose size it suited. On the tree above, pieces of suet and bacon rind attracted the black-and-white barred, brown-headed Gila Woodpeckers, perhaps the pair which had nested in the live oaks of the ranch house.

Besides the Canyon Towhee there there were two others, the common black one, and the unusual Green-tailed, both shy ground birds which came for the seeds dropped from the table and those that in acknowledgment of their earthly preferences were scattered on the ground for them. The black Spurred Towhee, which was heavily marked with white on back, wings, and tail, was seen mostly in his proper setting, scratching among the reddish brown sycamore leaves that matched his rufous sides, well shielded by a protecting tangle of grape vine. He stayed through the winter but when spring came quickly disappeared, for he did not belong among the mesquites and sycamores of our low level.

The Green-tail was first discovered with excited pleasure, feeding on the ground with a party of Gambel's. His plumage was at its best at the time, both for its delicate tones and its high lights. The unusual yellowish green of his wings and tail are always interesting but as he clambered down a bush through the sun it was a flash from his light rufous crown that identified him. As he faced us the dark gray of his throat made his white chin patch stand out astonishingly, like a great white pearl. No mistaking the one who wore that. But when this surprising bird stood quietly in the shadow of a mesquite his presence might easily pass unnoted. With dainty, timid motions of wings and tail he hopped down to scratch among the leaves, jumping and kicking back in true Towhee style. After feeding modestly on the ground all winter, toward spring he was occasionally seen on the feeding table. Once when he made his habitual run from the protecting vine thicket to the ground food dishes, finding them empty, he climbed up to the table, branch by branch. Later he flew to it from its own level, but shortly after dropped to the ground again. When I saw him, or one of his brother earth lovers, sitting up in a tree in the sun I was so amazed that I made a note of it.

As familiarity increased his confidence, our Green-tail began to show some spirit. One day as he came briskly out he calmly drove off an inoffensive Gambel's who happened to obstruct his path. And near the end of April when the striped-cheeked Lark Sparrows came and established themselves at the table, meek, timid Green-tail acted the part of Old Inhabitant. To be sure, when he first found himself near one of the self-possessed New Comers he drew back shyly as was his wont but shortly, as if reacting to its calm assurance, he actually jumped at his bird and fluttered over its head so domineeringly that the big Sparrow accepted the rebuke and flew off—for the moment. While only one of the Green-tails spent the winter with us, on March 29, he was joined by a second, and on April 10, two were on the table; while on May 3, three were in evidence. One of these had evidently met with an accident, for he was minus a tail, but he went about with a lively cheerful air as if thankful it were no worse.

Among the most regular visitors to the feeding table all through the winter and spring were the Mockingbirds, but while they found some of the food put out to their liking, the water was what attracted them the most, especially as warm weather came, when they were very thirsty. While the Sparrows and most of the other birds that came perched on the edge of the water pan and leaned down to drink, the Mockers, by reason of their long legs and larger bodies were able to stand on the table beside the pan and reach over to the water.

The Phainopeplas, or Silky Flycatchers, the crested males jet black, the females gray, were also thirsty birds. Although a few of them visited the misletoe near camp during the winter it was not until a spring contingent arrived about the middle of April that they were noticed coming for water. After that, for some time they came regularly at breakfast time and on warm days, at noon, when we could watch them from our own table under the trees a few yards away. Sometimes one after another would fly down to the pan until there were five or six drinking at the same time. A satiny black male might be squeezed in between two dull gray females or immatures. Like the female Cardinal the female Phainopeplas were sometimes shy, coming with partly flattened crests. The large, plump Mockingbirds which drank with them

were a decided contrast, looking up at us with calm confidence. They would take great draughts of water before standing erect, while the slender Phainopeplas would lean over the pan, take a sip, and raise up, their black bills wet and glistening. Sometimes we would catch the jet of a long square-cornered tail or a flash from a white wing patch as one started to fly. During dinner on April 28, we counted eleven Phainopeplas, four or five of them black males standing on the water pan or perching in the green branches above. When a crowd of birds of other kinds were on the table they would not go down to it. They would, perhaps, stop in the trees across the trail and look and crane their necks and lean toward the table, but in spite of their compelling thirst they would wait until they could have a quiet moment with those of their own kind. Once when a gray Phainopepla wanted to drink and a Cardinal was in possession of the pan, it hesitated on a twig above the water after it had started forward actually holding onto its perch with its feet until it swung head down like an acrobat. As it dropped the Cardinal made a pass at it before flying off.

When looking out at the birds from inside the tent one day I was astonished to catch sight of the strange parrot-billed Pyrrhuloxia with pink vest and long crest, on the bushes below the feeding table; but while I was gloating over the rare sight he vanished.

During the migration, watching the bird table became doubly interesting. There was no telling who would come during the day. On April 23, a familiar, faintly whistled note made me look up, and in a moment more I caught a fawn-colored, crested form and then the yellow tail band and red-wax wing tippings of the Cedar Waxwing. Three finally came to the branches just over the bird table but as their relatives the Phainopeplas and others were at the water pan they did not come down.

On April 24, when the bird table was being photographed, a meek little Inca Dove was discovered on a branch over the table and later was seen on the pan. "It drinks like a horse," was suggested, for after putting its bill in the water it kept it there, not raising it to swallow as the other birds did. When it flew down under the table to pick up seeds, its scaled plumage and long, tightly closed tail showed plainly and when it flew up the brown inner webs of its wing quills were disclosed.

On April 26, the first Lark Sparrow was found on the table. When flying to it his white tail corners showed well and when standing on the table in the sun his crown and cheek stripes shone out strikingly in formal pattern. His burred song, after the clear song of the Gambel's to which we had been listening all winter, sounded strange to our ears. A week after his arrival four were seen on the table at once. Their assurance was still affecting the nerves of the usually self-effacing Green-tail, and on more than one occasion the Old Inhabitant was seen flying at the New Comer with temper.

April 27 was a banner day at the bird table. While we were at breakfast a beautiful gray-headed, yellow-breasted McGillivray's Warbler—seen before near the ranch house—appeared for a moment on the bird table. Later when a Green-tail was on the water pan, a big Cassin's Flycatcher flew in and perching on a twig above looked down at the water, his white chin patch showing well against his dark throat. He evidently wanted to go down to drink but he was big and awkward. Finally, however, he managed to get himself down to the edge of the pan and leaned over, drinking with satisfaction. He stayed there until a Canyon Towhee came along when, perhaps not knowing its gentle spirit, he flew away. Then, much to my surprise, a Long-tailed Chat, always a handsome bird with his deep yellow breast, cool olive back, and clear white eye-markings, appeared on the scene. For a week the shy, secretive visitor stayed about camp, coming out of the grape vine thicket to get food and water, when, strange to say, he showed no hesitation about driving off the Sparrows which he found in his way. Day after day, much to my amusement he returned to a pan on the ground to get a taste of raspberry jam, apparently enjoying sugar as much as the Crossbills do salt. Later a pair of the big, distinguished looking White-winged Doves drifted up from the ranch-house oaks to the bird table and after picking up a little food jumped up on the water pan and walked along its rim showing their pretty pink feet. On that same eventful day two other birds were seen on the fragrant yellow-tasselled mesquite over the bird table. One, the black-capped, yellow Pileolated Warbler, who looked down jauntily at the table in passing; the other, the large dull-red and brown-cheeked Hepatic

Tanager. Below him two Gambel's Sparrows and two Phainopeplas were on the pan drinking and while we looked a Mockingbird flew in. What did they find to attract them? He flew closer and closer to the table and turned with a deliberate air as if to judge for himself, but failing to find either insects or berries, flew off.

Another of the birds which apparently came to the mesquite to see what was the attraction and went away without testing the fare was the Arizona Hooded Oriole, from the sycamore tree over the tent. Probably juicy insects and ocotillo syrup had already quenched his thirst.

On April 28, a female Black-headed Grosbeak was seen above the table, and on May 3, a male, but just as we were looking for him to go to the table something startled all the birds and he rose with the flock.

May 1 brought two surprises. First, when I looked up, a dainty blue-headed Lazuli Bunting stood perched over the table. Hardly had I had time to recover from my surprise and congratulate myself on seeing my little California friend again, however, when he disappeared. Then to my astonishment, on a tree across the trail from the table thare appeared a bird I had never seen—a large black, red-eyed Bronzed Cowbird. Instead of looking wistfully across at the food and inching over timidly a little at a time as most of the birds did on their first arrival, he calmly flew across and fell to, drinking his fill and eating as if famished. His meal over, he flew down to the ground and for a few moments paraded around in the sun, where his large bill, bluish iridescent wings, bronzy neck, and theatrical red eyes showed strikingly; after which he left as suddenly as he had come, to be seen no more. Fearless, self-confident, he had taken what he wanted without question, in characteristic Cowbird manner. What a positive character! I could not get him out of my mind.

That morning when we had been breakfasting a bright red Cooper's Tanager had appeared on the bird table. Before we could more than exclaim at his brightness—such a contrast to the dullness of the Hepatic seen there before—he was gone. But during the afternoon he returned and drank from the water pan.

On May 2, a bird which may have spent the winter in the neighborhood appeared in the flock of Gambel's Sparrows, a White-

crowned Sparrow, distinguished from his confreres by the small but important mark, the black spot between his bill and eye.

One of the Gambel's Sparrows gave me a surprise that day by taking a bath in the water pan. He was the first bird I had seen all winter presuming to use water for that profane purpose. For in that year of drought in the desert both bird and beast were fortunate indeed if they could get enough to drink. The bath was doubtless accounted for by the fact that *gambeli* is a bird of lush mountain meadows threaded with running brooks. Certainly no right-minded desert bird would have been guilty of such shocking wastefulness.

The following day to my great satisfaction the third and last of the Tanagers to be looked for here appeared over the bird table —the red-headed, yellow-and-black Louisiana. For some time in the characteristic deliberate Tanager way he looked down at the table as if trying to fathom the strange phenomenon, but at last dropped down to the water pan.

The next three days we were so busy breaking camp that we had no time for the bird table. But although we left the mountains without seeing the last birds the migration should have brought us, I had seen enough to leave with a lively sense of the keen interest and pleasure afforded by a camp feeding table.

Of course many migrants, especially Warblers, Vireos, Flycatchers, and Hummingbirds passed through the neighborhood, many of them through camp, without visiting the bird table; but that is another story.

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A VISIT TO MIDWAY ISLAND.

BY PAUL BARTSCH.

THE little paper here presented was prepared as we left Midway Island in 1907, it being my intention to send it to 'The Auk' from Guam. The manuscript was lost, and has only recently again come to hand. Believing that the data contained in it have sufficient value to merit publication I submit it even at this late date.

On the night of November 6, we sailed under half steam that we might reach Midway at dawn. In the first dim light of the following morning we sighted the islands as a faint mist on the horizon, and shortly after came close enough to see the surf pounding the narrow barrier reef that encloses the lagoon and the two islands. Midway is situated in Latitude 28° 12′ 22″ N., Longitude 177° 22′ 20″ W., about 1,000 miles west by north from Honolulu. The encircling reef forms an almost complete fringe, its chief interruption being to the northwest, where there is a channel of sufficient depth to admit a steamer in fair weather. Were the ring complete it would measure about eighteen miles. The two low sand islands are both near the southern end of the lagoon.

As soon as the necessary formalities had been discharged, Mr. Wells and I left the "Albatross" for the islands. We touched on Sand Island, which contains the telegraph station, and the barracks, to secure information how best to approach Eastern Island, then set out for it. The space between the two, a little more than a mile and a half, is shallow, showing a bottom thickly studded with heads of coral which come close to the surface and make rowing rather difficult when the sea is choppy. We spent all of November 7 on Eastern Island, which is a low pile of more or less consolidated coral and shell sand, of roughly triangular outline. The southern edge is almost a mile long and separated from the reef by a channel about an eighth of a mile in width. Its length from north to south is about three quarters of a mile, and the entire island excepting the beach is covered by a scanty growth of Scaevola bushes, grass and sedge, the ground itself being literally honeycombed by the nesting burrows of the wedge-tailed petrel.

On November 8, we visited Sand Island, which is boot shaped, with the leg of the boot a little wider than the conventional concept, the toe pointing in a south westerly direction and the front and back of the leg north and south. Its greatest north and south line is a little more than a mile, while its greatest east and west is a little more than three quarters of a mile wide. Sand Island is much more elevated than Eastern Islands. Its highest point, which is in the middle of the northern line at some little distance from shore, is forty-three feet and this place is occupied by the cable station and the marine barracks. This end of the island is

a bleak, barren waste of white sand, very trying and tiring to the eyes. The southern edge of the island consists of a series of sand dunes covered with Scaevola bushes, of which there is quite a thicket on the southwestern part. In the interior the dunes are more scattered and the vegetation is less developed.

Midway has been visited twice before by ornithologists. In 1891 Mr. Henry Palmer, while making collections for Rothschild, spent a week here, July 11–17, a journal account of which is published in Rothschild's 'Avifauna of Laysan,' pp. xiii–xiv, 1893–1900. He records fourteen species:

Megalopterus minutus melanogenys (Gray)
Gygis alba candida (Gmelin)
Diomedea immutabilis Rothschild
Diomedea nigripes Audubon
Puffinus cuneatus Salvin
Phaethon rubricaudus Boddaert
Fregata minor palmerstoni Gmelin
Sula leucogastra (Boddaert)
Sula dactylatra personata Gould
Sula piscator (Linnaeus)
Heteroscelus incanus (Gmelin)
Phaeopus tahitiensis (Gmelin)
Porzanula palmeri Frohawk
Telespiza cantans Wilson

The second visit was made by Mr. William Alanson Bryan, then of the Bishop Museum, Honolulu, who spent a day and a half here on August 21 and 22 in 1902. He has published on this visit in 'A report on a visit to Midway Island' in the Occasional Papers of the Bishop Museum, August 26, 1905, pp. 37–45. In this paper the following species were listed:

Sterna fuscata oahuensis Bloxham
Anous stolidus pileatus (Scopoli)
Megalopterus minutus melanogenys (Gray)
Gygis alba candida (Gmelin)
Diomedea immutabilis Rothschild
Diomedea nigripes Audubon
Puffinus cuneatus Salvin
Phaethon rubricaudus Boddaert
Fregata minor palmerstoni Gmelin
Sula dactylatra personata Gould
Sula piscator (Linnaeus)

Phaeopus tahitiensis (Gmelin)
Arenaria interpres oahuensis Bloxham
Porzanula palmeri Frohawk

During our short visit we noted all the species recorded by these two observers, with one exception; namely, *Sula leucogastra*, but we also observed five additional species not recorded by them.

I am indebted to Dr. Richmond and Mr. Riley of the Division of Birds U. S. National Museum, for the latest dictum in the scientific names used in this paper.

Sterna fuscata oahuensis Bloxham. HAWAIIAN SOOTY TERN.—Several groups of Sooty Terns were seen on the beach at Eastern Island and scattered individuals in and among shrubbery of the interior. All in all, we probably saw two hundred living individuals. Among the bushes, however, a large number of dead, both youg and old, were found in various stages of decomposition. On Sand Island the conditions were still worse. Less than a dozen living individuals were here noted while hundreds of dead bodies were strewn among the Scaevola bushes bordering the southwestern shore. Here, too, the dead seen were fledged young and adults. It would seem as if some epidemic had invaded this colony and almost overwhelmed it.

Anous stolidus pileatus (Scopoli). PILEATED NODDY TERN.—Quite rare on both islands. Not more than a dozen specimens were seen flying about Eastern Island and a single individual only was noted on Sand Island.

Megalopterus minutus melanogenys (Gray). HAWAIIAN TERN.—Very rare—Only a single living individual, which we photographed, was seen sitting under some low bushes. It was exceedingly tame, so much so that I believed it to be sick. A number of dead specimens were found among the dead Sooty Terns on Eastern and Sand Islands.

Gygis alba candida (Gmelin). HAWAIIAN WHITE TERN.—This exquisite little bird was found on both islands. It is more abundant on Eastern, where we saw probably two dozen specimens. This bird is as fearless as it is beautiful, hovering over the intruder's head almost within reach of his hand, alighting in the nearby shrub when you come to a stop, watching you the while with inquisitive eyes. Birds of this type make collecting difficult, not because they are hard to obtain, but on account of their confiding nature. None were taken.

Diomedea immutabilis Rothschild. LAYSAN ALBATROSS.—These birds mingled with the Black-footed Albatross and averaged about one to twenty of the latter. They seemed to be more partial to that portion covered by vegetation than the sand dunes, though some were also found in open places. In a number of instances two birds were found together, apparently paired, rehearsing their curious love ceremonies. One individual, caught and held for a moment, offered his dinner as a ransom. The

contribution consisted of a mass of Scaevola berries and several large pebbles. Their fearlessness made photographing them a very simple performance.

Diomedea nigripes Audubon. BLACK-FOOTED ALBATROSS.—I was told by the inhabitants of the station that these birds are now beginning to return to their breeding ground, and that a little later there would be a hundred on Midway to each one now present.

Although these birds were within sight of our ship ever since we left San Francisco, I little appreciated their stately proportions until I met them here on shore. On wing they look so trim—not at all bulky, as they do when on land. Their flight when a good breeze is whipping white caps on the sea reminds one of gigantic Chimney Swifts, but when the wind is low they are less active and might then even be called awkward flyers.

As we landed our boat on Eastern Island a sudden shower of short duration forced us to seek shelter under the Scaevola bushes on shore. These being insufficient to protect us from the driving rain and cold, we finally buried ourselves in the sand and thus succeeded in hushing the tattoo of our chattering teeth. While here, inquisitive Albatrosses formed a circle about us. We also excited the curiosity of the only mammalian representatives on the islands, eight burros, which joined the circle of clamoring birds and gazed with wondering eyes, outstretched necks and protracted ears at the curious, to them apparently bodiless heads resting on the sand. I regretted much not being able to secure a photograph showing the combination of Albatross and ass. I was told that two of the officers at the station had imported a pair of these asses to be used for riding about Sand Island, but finding them too destructive, they transported them to Eastern Island and turned them loose. Here they have multiplied to the number of eight and seem to be in good condition. They are of the tall, exceedingly long-eared, shaggy-coated variety and would have proved interesting objects to the student of the effect of environment upon mammals. The question of their water supply interested me, and I was told that they pawed in the sand at some little distance from shore until water was exposed, which they drank. I understand that the entire "asinine" population, consisting of twenty-two specimens, was killed in 1912 or 1913 to stop their destruction of the homes of the burrowing birds by breaking through the shallow roof of their tunnels.

Most of the birds were in groups on Eastern, and the open sandy portion of Sand Island. Some of the groups must have contained a hundred birds or more. They were evidently mating, for they were going through their curious song and dance ceremonies. These performances were participated in at times by single pairs, at other times by large groups. Smaller groups and single pairs were scattered all through the island and one pair was seen engaged in copulation, which would speak for a breeding season close at hand.

On Sand Island we saw heaps of bleached bones of Albatrosses, a reminder of a visit to this island by Japanese plume hunters, who are said to have made regular trips to this and neighboring isolated islands for skins and feathers.

Puffinus cuneatus Salvin. WEDGE-TAILED SHEARWATER.—This species at the present time is a close second as far as numbers are concerned, to the flightless rail on Eastern Island. All the elevated portions of the island were thoroughly honeycombed by their nesting burrows, and these rendered walking rather difficult in many places. The burrows are only a short distance below the surface, leaving the upper arch too weak to support the weight of a man. We found ever so many young birds all seated outside, near the entrance to the burrows. Some of these were still in their dusky, downy plumage, while others had attained the garb of the parents. Many of the old birds were seen flying about and occasionally one would drop near its nestling.

For several nights prior to our reaching Midway, specimens of this species came aboard our boat. On the last night no less than three were caught.

Oceanodroma castro (Harcourt). HAWAIIAN PETREL.—Three specimens of this species came aboard while we were at anchor within the encircling barrier of coral reef at Midway.

Oceanodroma tristrami Stejneger. TRISTRAM'S FORKED-TAILED PETREL.—A specimen of this species came aboard the "Albatross" on the night previous to our arrival at Midway, November 6, at Latitude 28° 15′ N., Longitude 176° 30′ W. Since this is but a short distance from the islands I have thought it best to include it in the list.

Pterodroma hypoleuca (Salvin). BONIN ISLAND PETREL.—A Petrel not quite so large as the Wedge-tailed Shearwater was seen flying about Eastern Island in company with the above named species. It appeared to have a smaller bill, and had white and black areas on the sides of the head. It is an extermely rapid flyer and exceedingly difficult to bag. Several specimens hard hit flew out to sea and none were secured.

Phaëthon rubricaudus Boddaert. RED-TAILED TROPIC BIRD.—Found on both islands, but as in the case of all the other species, more abundant on Eastern. Here we found a number of almost fledged young birds scattered irregularly on the ground under the low bushes, each in a small, clear, clean spot, cackling and hissing and mad as the proverbial wet hen on account of our intrusion. These birds, while fully the size of the adults, did not have the long tail feathers. Quite a number of birds were seen on wing, some flying overhead and following us about the island, others fishing out at sea. It was a pleasing sight to see them plunge into the water like a rocket from a great height, disappearing completely below the surface. Most of the birds on wing possessed the long tail feather.

Fregata minor palmerstoni Gmelin. MAN-O'-WAR BIRD.—Man-o'-war-birds could be seen at all times high above the islands, hanging in

the air on motionless wings. A few were found sitting on bushes near the middle of Eastern Island.

Sula leucogastra (Boddaert). BOOBY.—Found breeding on Midway Island by Palmer, July 14.

Sula dactylatra personata Gould. BLUE-FACED BOOBY.—A few of these birds were seen flying about both Islands.

Sula piscator (Linnaeus). RED-FOOTED BOOBY.—Three individuals of this species were found seated in the dry sandy plain on the middle of Sand Island in company with the Black-footed Albatrosses, Curlews and Golden Plovers.

Porzanula palmeri Frohawk. LAYSAN ISLAND RAIL.—Mr. Henry Palmer states in his diary published by Rothschild in 'The Avifauna of Laysan,' page xiv, that Captain Walker's son liberated on this island a pair of Laysan Island Rails. They must have found the conditions very suitable for them here, for they are certainly very abundant now. The little fellows remind one more of mice than birds as they scurry away from under your feet and dodge your hand when you try to catch them. They are exceedingly quick and expert at dodging, so much so that we found it next to impossible to catch one, even when in so small a piece of brush as two feet square. One little fellow, whom we had chased into rather open ground, sought safety by diving into a Petrel burrow where we caught him. After examining him we set him free. This experience did not frighten him very much, for after running a short distance into a clump of shrubbery, he crept cautiously forth, eyeing us curiously, undoubtedly wondering about the meaning of the whole affair. If one sat quietly in any place in the shrubbery on this island, one or more of these birds would come up to within reach. A move on your part would make them retreat just beyond your reach but never any distance. This little Rail is at the present time probably the most abundant bird on Eastern Island.

Pisobia acuminata (Horsfield). SHARP-TAILED SANDPIPER.—Two specimens of this species were secured on Sand Island, where several others were seen. They frequent the open sandy stretches between the Scaevola bushes and in their habits recall our Pectoral Sandpiper.

Phaeopus tahitiensis (Gmelin). BRISTLE-THIGHED CURLEW.—Quite abundant on both islands, where in company with the Golden Plover it frequents all parts of the island excepting those covered by brush. These birds were quite tame as well as curious and when flushed would frequently fly about us, emitting their peculiar cry. Specimens shot were in excellent physical conditions and crammed full of Scaevola berries. The flesh was delicious and quite free from the usual fishy taste, which was probably due to their diet.

Pluvialis dominicus fulvus (Gmelin). PACIFIC GOLDEN PLOVER.—Four specimens of this species were secured. They were quite abundant on both islands, frequenting the grassy plots and the open sandy places, in fact all parts but those covered by Scaevola bushes.

Arenaria interpres oahuensis Bloxham. PACIFIC TURNSTONE.—Abundant on both islands, everywhere. It was a decided surprise to us to find waders in bushes feeding upon berries, and yet this was the case here. Again and again we flushed bunches of Turnstones from the dense Scaevola thickets and watched them circle about for some time, only to re-alight in the tops of another clump of bushes. Specimens shot on Sand Island were filled with Scaevola berries. On Eastern Island we saw them running on the beaches following the waves and feeding in the orthodox manner.

Asio flammeus sandwichensis (Bloxham). SHORT-EARED OWL.—A single specimen was flushed from a Scaevola covered sand dune on Sand Island. We marked the place where it alighted near the middle of the western shore, but the bird was very wild and left long before we came within gun-range, flying far out to sea before swinging to the southern point of the island. A further attempt to add it to our bag proved equally unsuccessful.

Telespiza cantans Scott Wilson. YELLOW FINCH.—I was told by Mrs. Florence McDerfee Nevin, the wife of Lieut. J. D. Nevin, who was in command of the Marine detachment at Midway at the time of our visit, that the birds locally called Canaries were brought to Midway from Laysan Island. They are not very abundant; we saw only three small flocks, probably twenty-five specimens in all, on Eastern Island, where they frequent the shrubbery. Like most of the other birds of the islands they are exceedingly tame and curious; rather sluggish in their movements and quite stupid. The only note heard was a half subdued squeak. They appear to be equally at home on the ground and in the shrubbery. Mr. H. Palmer says in Rothschild's 'Avifauna of Laysan' that Capt. Walker's son liberated a Finch on the island. It would be very interesting to get definite data of subsequent importations which made the present colony possible, for Palmer does not list it as a resident on Midway.

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THE FALL MIGRATION OF HAWKS AS OBSERVED AT FISHERS ISLAND, N. Y.

BY A. L. FERGUSON AND H. L. FERGUSON

FISHERS ISLAND, N. Y., lying as it does at the eastern entrance of Long Island Sound, is a connecting link between Rhode Island and Long Island, N. Y., and with the other two islands, Gull and Plum, affords stopping places for birds of all kinds on their migration southward each fall.

Thirteen species of hawks have been collected on the Island though only six are classed as "common" by us. By far the most common is the Sharp-shinned Hawk, and then, according to numbers come the Pigeon Hawk, Marsh Hawk, Sparrow Hawk, Osprey, Duck Hawk, Cooper's Hawk, Red-tailed Hawk, Red-shouldered Hawk, Rough-legged Hawk, Broad-winged Hawk, Goshawk, and one record of a Gyrfalcon. The last was shot October 10, 1915, and identified by Dr. F. M. Chapman, as *Falco obsoletus*. This is the only record of this bird from the Island. The Buteos rarely come over Fishers Island, and at the most, it would be safe to say that not more than ten of each kind are seen in any year. Possibly the instinct of these hawks keeps them over wooded countries, but why they should like a different route from the Sharp-shinned Hawk, which is a wood-loving bird also, is difficult to figure out. Owing to their small numbers, the Buteos, Cooper's Hawk, and the Goshawk are classed as rare birds with us at the Island, and only notes on what we feel were remarkable flights of Sharp-shinned Hawks, Marsh Hawks, Pigeon Hawks, and Duck Hawks are given separately.

When the migrating instinct grows strong enough to call them southward, the hawks come in great waves. Whether or not weather conditions affect all birds we do not know, but it is a certainty that the necessary weather conditions must exist in order for a large flight of hawks to come over Fishers Island. If conditions are not suitable, the flight does not come, though occasional hawks may be observed, but when the conditions are right, they fly in great numbers. As a general rule we get several flights each fall. The first about September 13; the second about September 20, which has always been the main flight; and the last flight, which is much smaller, near the end of September, or early in October.

The favorable conditions for a flight follow, but it must be borne in mind, that a flight day is chiefly a Sharp-shinned flight, though many Marsh Hawks and others are seen; thus making the large total. On any date after September 5, if a decided change of weather occurs, and is followed by a clear, bright day with a north-west wind and large white clouds, we invariably get a flight. That the wind plays the most important part we know from our

records. On some days we have had the flight commence early in the morning, only to have it stop completely when the wind changed from north-west to north or north-east. For the last six years we have made notes of the hawks passing over Fishers Island, and have found that with only a few exceptions the flight has come when the wind was from the northwest. The days when these exceptions occurred the surface wind was northeast, and the hawks were flying at a great height, and at a level where we believe the winds were moving from the northwest, though this could not be determined, as there were no clouds. This belief in a northwest wind being necessary for a flight was studied by the late Prof. C. C. Trowbridge, who published his observations in 'The American Naturalist.' From our own observations we agree with him, for we had reached the same conclusion before he sent us his article in 1918. In his article were given tables showing the wind and weather conditions on flight days, and as similar tables may be of interest we give below tables showing the weather conditions, kindly furnished by the Weather Bureau at Providence, lying to the north of Fishers Island, together with the local conditions at the Island, with notes on each day's flight.

Date	Wind at Fishers Island	Wind at Providence R. I.	Character of day	Temperature change last 24 hours	Notes
Sept. 16/16	N. W.	N. W.	Pt. Cloudy	—12°	Small flight of Sharp-shinned and Marsh Hawks.
Sept. 19/16		N. W.	Clear	— 2°	Small flight of Sharp-shinned, Marsh, and Pigeon Hawks.
Sept. 25/16		N. W.	Pt. Cloudy	— 4°	Small flight of Sharp-shinned, Marsh and Pigeon Hawks.
Sept. 26/16		W.	Clear	+ 1°	Slightly larger flight of mixed hawks.
Sept. 30/16		N. W.	Clear	—15°	Large flight of mixed hawks.
Oct. 1/16		N.	Clear	— 3°	Small fight of mixed hawks.
Sept. 10 17		N. W.	Pt. Cloudy	— 8°	Few Marsh, Sharp-shinned, and Pigeon Hawks.
Sept. 11/17		N. W.	Clear	0°	Small flight of Marsh and Sharp-shinned Hawks.
Sept. 18/17		N.W.	Pt. Cloudy	+10°	Small flight of Marsh and Sharp-shinned Hawks.

Sept. 22, 17		N. W. & N	Clear	—13°	Good flight Marsh, Sharp-shinned, and Pigeon Hawks and a few Cooper's Hawks.
Oct. 4/17		S. W.	Cloudy	+ 4°	4 Duck Hawks shot. Some Pigeon Hawks.
Oct. 8/17		S. W.	Pt. Cloudy	+6°	2 Duck Hawks shot. Few Pigeon Hawks seen.
Sept. 7/18	N. W.	N. W.	Pt. Cloudy	—10°	Small mixed flight.
Sept. 9/18	N. E.	N.	Cloudy	+2°	Good flight, Birds very high, 269 hawks seen.
Sept. 11/18	N. E.	E.	Clear	—12°	Good flight, Birds very high, 351 hawks seen.
Sept. 22/18	N. W.	N. W.	Cloudy	—11°	Small mixed flight.
Sept. 22/18	N. W.	N. W.	Clear	— 2°	Large mixed flight.
Sept. 23/18	N. W.	W.	Pt. Cloudy	+ 4°	Flight diminishing.
Sept. 30 18		N. W.	Clear	— 5°	Small Pigeon Hawk flight.
Oct. 1/18		N. W.	Clear	0°	Small mixed flight.
Oct 14/18		N. W.	Clear	—11°	Small Pigeon Hawk flight. A few of other species seen.
Sept. 12/19	N. W.	N. W.	Pt. Cloudy	+ 1°	Small flight of Sharp-shinned, and Pigeon Hawks.
Sept. 13/19	N. W.	N. W.	Clear	— 1°	Fairly large mixed flight.
Sept. 14/19	N. W.	N. W.	Pt. Cloudy	+ 1°	Flight diminishing.
Sept. 17 19	N. W.	N. W.	Pt. Cloudy	+ 5°	Large mixed flight, many Sharp-shinned and Pigeon Hawks.
Sept 18 '19	N. W.	N. W.	Clear	— 6°	Very large flight, mostly Sharp-shinned Hawks.
Sept. 26, 19	N. W.	N. W.	Clear	— 8°	Fairly large mixed flight.
Sept. 2, 20	N. W.	N. W.	Clear	— 6°	Small flight of Marsh, Pigeon and Sharp-shinned Hawks.
Sept. 3, 20	N. W.	N. W.	Clear	+ 4°	Small flight of Marsh, Pigeon and Sharp-shinned Hawks.
Sept. 4, 20	N. W.	N. W.	Clear	+ 2°	Small flight of Marsh Pigeon and Sharp-shinned Hawks.
Sept. 9, 20	N. W.	N. W.	Clear	+ 2°	Increasing number of Sharp-shinned Hawks.
Sept. 13, 20	N. W.	N. W.	Pt. Cloudy	+ 2°	Small Pigeon Hawk flight, others mixed in.
Sept. 14, 20	N. W.	N. W.	Cloudy	— 7°	Increasing number Sharp-shinned, Pigeon and Marsh Hawks.
Sept. 17, 20	N. W.	N. W.	Clear	— 3°	Small Pigeon Hawk flight.

Sept. 19/20	N. W.	N. W.	Clear	—13°	Very large Sharp-shinned Hawk flight. 2000 Hawks estimated.
Sept. 20/20	N. W.	N. W.	Pt. Cloudy	— 1°	Large flight but diminishing.
Sept. 21/20		S.	Pt. Cloudy	+ 5°	Very large flight of Marsh and Sharp-shinned Hawks.
Sept. 26/20	S. W.	W.	Clear	+ 2°	Small Pigeon Hawk flight.
Sept. 28/20	S. W.	S.	Cloudy	— 3°	Large Pigeon Hawk. flight.
Oct. 4/20	S. W.	S. W.	Clear	+ 4°	12 Duck Hawks seen. Also a few Marsh and Pigeon Hawks
Oct. 5/20	N. W.	N. W.	Pt. Cloudy	—10°	3 Duck Hawks shot. A good many Pigeon and Sharp-shinned Hawks.
Oct. 6/20	N. W. & N. E.	N. W.	Pt. Cloudy	0°	Large flight of Sharp-shinned Hawks over by 9.30 A. M.

From the above it will be seen that of the 42 flights noted,—

31 of these were on a N. W. wind
23 of these were on a falling temperature
22 of these were on clear days
15 of these were on partly cloudy days.
5 of these were on cloudy days.

It is evident from the tables that the hawks are retarded on their flight by adverse winds. They gradually drift south until they reach the ocean's edge, and when the weather becomes favorable again, start on their south-westerly flight. That the northwest wind aids, is due to the wind helping to raise the bird, and making flying easier. This is readily seen along a mountain range when the hawks are seen to be flying, in most cases, on the windward side. The reason for this is that the winds striking the mountain side are deflected upward, which exerts pressure from below and makes flying much easier. Hawks, when flying with a favorable wind, travel much more regularly, and do not stop to circle in order to gain elevation, as is noted on days when the wind is not suitable. When the wind is not favorable, wind currents are found at certain spots, and hawks, reaching these points, will commence to circle around, gaining elevation at each turn, until they reach the desired level where the wind is suited to them, and then again they take their desired course.

The Sharp-shinned Hawks, as stated, come in great numbers and when migrating do not pay much attention to what is before them, but keep on their general course, regardless of anything that would ordinarily frighten them. If a decoy owl is used, they will change their course at times, and fly near it, but will seldom make more than one dart at it. How little attention they pay to people, was learned one day when at least eight or ten in our party were having lunch, for the Sharp-shins continued flying by, over and past us, though we had no owl up, and were plainly in view. The Sharp-shins are affected more than any of the hawks by weather conditions, and to get a great flight the day must be just right in every respect. The young birds are the first to come, and late in the flight season the adults are met with. It is most interesting to watch a good flight. Some birds will be high up, sailing straight along, keeping up their momentum with occasional beats of their wings. Others will be flying close to the ground, taking advantage of hollows and hillsides, to get the most favorable wind currents, while others may be seen darting through the patches of woods, hunting for small birds.

The Sharp-shinned Hawk, with his light build, rounded wings and long tail, finds that flying is easier when he is headed a little to the west of the northwest wind, which helps to support him and allows him to slide along slightly sideways on his desired course. During this past September, 1921, we had no Sharp-shin flight. At the general time for a flight,—September 10, to September 25,—we did not have a single day when the wind was favorable; in fact for the entire month the weather conditions were adverse. On a few mornings the wind appeared to be from the northwest, but would soon veer to the north and east. Not until October 6, did the correct conditions occur, but most of the Sharp-shins had by that time drifted along the Connecticut shore.

The Pigeon Hawk is very common at the Island during migration. These small falcons prefer a southwest wind to fly on, though numbers come along on a northwest wind. They feed early in the day, and rarely is one collected that is not found to be packed full of birds. They are very savage, and are ready to fight at any time, either with another Pigeon Hawk or a decoy owl. At the decoy we have seen one return seven times, dashing

in and squealing, but never striking. They decoy better than the Sharp-shins, and when once near the owl are not afraid of a person. The young birds migrate first, and the adults later, like the Sharp-shinned Hawk. Like their big relation, the Duck Hawk, they are compactly built and feathered and have not the feeling of a Sharp-shin, which seems loose and fluffy when handled. They are strong fliers, and do not hesitate to move along even if the wind is strong and directly against them.

The Marsh Hawk commences his southward flight about August first, and some come along nearly every day regardless of weather. Of all the hawks, these are the shyest and most suspicious, and a person must be well concealed if he wishes them to come close, as they see a man nearly as soon as a Crow would, and fly off. These hawks are not fast fliers compared with some other species. While hunting they sail about the open fields and patches of bayberry, until they come across something to their fancy, when they pounce upon it. We have seen them coursing over open fields where many pheasants were feeding, and apparently paying no attention to them. At other times they have suddenly glided over the field and made a kill of a nearly fullgrown English Pheasant. At the decoy owl they at times dash in with feet out, and strike, giving a low squeal, but seldom return again. The adult birds, as with the Sharp-Shinned and Pigeon Hawk, are the last to come.

Of all the hawks, the Duck Hawk, similar to the Peregrine Falcon of Europe, is the most interesting species we see at the Island. Nowhere is it common, though widely distributed, but a number visit us each fall. A few come on the regular flight days, but, like the Pigeon Hawks, they prefer a southwest wind to any other. A strong wind is no hindrance to them, and we have come to feel that a typical Duck Hawk day is one when the wind is blowing from the south-west, with almost a hint of bad weather. When the decoy owl is seen by a Duck Hawk, it at once flashes up to the attack, but after the first dash usually goes on its way. At the nesting time, however, the attack will be kept up for a long time, and we have had a female continue to strike even after the decoy was headless, and all resemblance to an owl was lost. The adults come mixed in with the immature birds during the migration,

but late in the season adults are still seen after the last of the young have gone by.

It is a recognized fact that the Duck Hawks are killers, but they are such wonderful fliers and make such a fine appearance that it is a great pleasure to watch them. Only this fall a cock Pheasant came flying nearly over us, and close in pursuit came a large female Duck Hawk, gaining rapidly. Seeing us, she veered off, and the Pheasant escaped into the brush. It is not to be wondered that this bird with its speed, strength and courage, was such a favorite in the days of falconry.

The little Sparrow Hawk is a courageous fighter and comes back time after time with his "Killy-Killy" call, to dash in on the decoy owl, but at the last moment veers off and never strikes. Five of these hawks have been seen about the owl at one time, and with their darting in and out, and squealing, afford an interesting study. While they take a few birds, they prefer insects, and are "good hawks."

The Ospreys while breeding in great numbers on Gardiners Island, about twelve miles to the westward, and also along the Connecticut shore, notably near Niantic, have not been known to breed on Fishers Island since 1890. Just why this is so is hard to explain, as they are never molested, and have good fishing grounds in every direction. They begin to migrate about September 1, and come in numbers, and we have seen one as late as November 22 but this must have been a straggler. At the decoy owl they often strike and squeal, and would damage it if not frightened away, for they return often to the attack.

At the request of the U. S. Biological Survey, we collected the stomachs and crops of the Sharp-shinned, Pigeon and Marsh Hawks for several years, and give below a table showing the contents. It will be found interesting, especially the report on the Marsh Hawk, which shows that whatever he does at other times, he is a killer of birds during the migration.

MARSH HAWK	SHARP-SHINNED HAWK	PIGEON HAWK
119 Stomachs sent	483 Stomachs sent	298 Stomachs sent
107 Birds	530 Birds	318 Birds
52 Mammals	16 Mammals	4 Mammals
2 Amphibians	38 Insects	967 Insects
8 Insects		
1 Fish		
11 Reptiles		

So few of the adult Pigeon, Sharp-shinned and Marsh Hawks do we see in comparison with the numbers of young birds, that we have come to the conclusion that the majority of the adults must follow a different course. Certainly we never see more than one adult for every ten young birds. In the spring we see scarcely any hawks, so it is evident they have different routes which they follow as they work their way back to their nesting localities.

Fishers Island, N. Y.

ADDITIONAL DATA REGARDING THE FAMOUS ARNOLD ARBORETUM MOCKINGBIRD.

BY CHARLES L. WHITTLE.

IN the 1921, July–August issue of 'Bird-Lore,' there is a short article by C. H. Early, entitled 'The Mockingbird of the Arnold Arboretum,' pp. 179–181 inc.; and in Vol. XXXVIII of 'The Auk' (1921) there is an exhaustive account of the Mockingbirds that have been recorded in New England and Canada, by Horace W. Wright, pp. 382–432 inc. In this article Mr. Wright deals at length with the history and imitative abilities of the same Mocker, a male, of which Mr. Early wrote in 'Bird Lore,' and commonly refers to him as the "Resident Mocker," since, for a number of years, the bird appears not to have left the Arboretum or nearby grounds at any season of the year.

So much has now been written about this more than locally-celebrated songster (*Mimus polyglottos polyglottos*), whose reputation for vocal ability promises to rival that of any bird of this

race yet recorded, that certain additional and important facts, not generally known, deserve a place in the record to complete as far as possible the history of the bird while he has abided in Boston, Massachusetts.

My first meeting with this Mocker took place on May 20, 1915, at which time a fellow bird student informed me that the bird had wintered in the Arboretum, having made its first appearance here in 1914. On this occasion the Mocker was in full song and even at this time his proficiency as a singer of other birds' songs was recognized. From the fact that I was told that the bird was first observed during the previous year, I have always referred to him in my notes as the "1914 Mocker." As Mr. Wright, in the article referred to above, p. 389, states that the bird was first seen here January 10, 1915, I have taken occasion to examine the basis for the belief, also current among other ornithologists, that he had passed the entire winter of 1914–15 in the Arboretum, and had therefore arrived here in 1914. Without going into unnecessary details, the evidence sought was obtained from Miss Julia A. Carter, Secretary to Prof. Charles S. Sargent, who for a number of years has made a practice of recording in her diary any unusual birds reported to her as having been seen in the Arboretum by Mr. Charles Faxon, who was associated with Prof. Sargent in his arboricultural work. Miss Carter kindly furnished me with a transcription of her ornithological notes, among which I find that on November 25, 1914, a Mockingbird was seen here, the first one reported in the Arboretum by Mr. Faxon since May 7, 1910. That Mr. Faxon saw this bird in the fall of 1914 is also confirmed by Mr. van der Voet, Superintendent of the Grounds, who informs me that Mr. Faxon also told him that the Mockingbird which afterwards became so well known, first appeared here at that time.

On page 395 of Mr. Wright's article, he mentions that Mr. van der Voet informed him on May 17, 1920, that "An observer had told him that he (the observer) had seen a second Mocker in the Arboretum a few days previous." Also, p. 395, Mr. Wright alludes to the "Alleged appearance of a second bird, presumably a female" and comments thereon at some length. In regard to his "Second Mockingbird," it should be stated that Mrs. Whittle

and I first ran across the new bird, apparently a female, on March 24, 1920, and we also saw the bird again on the following March 27 in the same place; and on one of these occasions we informed Mr. van der Voet of the fact and asked him to report to us if the new bird later associated with the Resident Mocker, or paired with him, for, on the two occasions mentioned, it was a singular fact, considering, that as far as known, no other female of this species had been in the Arboretum during the previous five and a half years, that the male bird kept by himself in one part of the Arboretum, vigorously mimicking other birds and singing his own song. The female, meanwhile, kept strictly by herself on the other side of the park, the two birds being not over seven hundred feet apart. The new Mocker gleaned her subsistence from the ground under hickory trees, and probably the pits, rendered available by the frost in opening the shells, formed the main part of her diet. During our visits on these dates her only note was a single, somewhat harsh cry, a note never uttered by the male during my five years' acquaintance with him so far as I am aware.

The above paragraph is written for the reason that I believe some confusion in the published record of the male Mocker has come about due to mistaking the female for the male, both by Mr. Early and by Mr. Wright. For example, Mr. Wright says, p. 395, that he saw the Resident Mocker on April 24 and 29, 1920, but he says it was not heard to sing. The presumption is that he was unknowingly observing the female, for at this season of the year and with temperature and other weather conditions as they were on these dates, namely, a maximum temperature of 54 degrees on April 24, and 59 degrees on April 29, the male bird was characteristically in song much of the time. Mr. Early, writing in 1921. 'Bird-Lore,' loc. cit., p. 179, speaks of seeing the "Mockingbird of the Arboretum," almost every time that he visited it "during the past six years." This statement may be true enough if the Mocker seen by him in January 1921 (see p. 180) was the Resident Mocker, but incorrect if he too mistook the new bird for the old one.*

* Since writing the above paragraph, 'The Auk' for October 1921, has been issued, and on p. 617, under "Recent Literature," Mr. Early's article in 'Bird-Lore' is briefly reviewed, the comment being that his article "Carries the history

In support of the contention that such confusion has occurred and that we have no positive knowledge that the 1914 Mocker has been seen or heard in the Arboretum since July 10, 1920, as reported to me by Mr. Early in a recent letter, or that he was seen by Mr. Early in January 1921, as stated in his article, loc. cit., pp. 180 and 181, I offer the following considerations, the principal ones being,—first, the fact that no one, among all the observers who are familiar with the bird, and its song, and I have canvassed the field rather thoroughly, bears testimony that it has been heard singing since July 10, 1920; and, second, the sudden appearance of a new Mocker, believed to be a female, about three months earlier, namely March 24, 1920; one bird leaves the scene shortly after another appears, and observers generally, and there are several of them, are not cognizant of the fact. It should be stated, however, that Mr. C. S. Anderson reports seeing and hearing a Mocker sing on one occasion, sometime during the spring of 1921, his oral report being that "The bird sang in a manner characteristic of the Resident Mocker but in a cracked voice." The bird was reported near the Bussey Institution. As no notes of the occurrence were taken by him and as the exact date is unknown, the value of the testimony is considerably impaired.

To any one thoroughly familiar with the singing ability, manner and times of singing and with the habits of the Resident Mocker such as his feeding places, the kinds of food eaten, and areas within the Arboretum frequented by him, the behaviour of the Mocker seen since July 1920 is in great contrast. During my acquaintance with the bird from May, 1915, to March, 1920, I have seldom found him any where except in the southeast portion of this park or just outside of it near the Forest Hills entrance among the small Siberian crab trees whose fruit in winter, rendered sweetish by frequent freezings and thawings, constituted his favorite and most dependable food.

The new Mocker when first seen remained in an area of its own well outside of the one frequented by the singing bird, and during

of this notable bird so fully described by the late Horace W. Wright (Auk, July, 1921) on for another year." One of the purposes of this article is to forestall just this kind of error from appearing in ornithological publications, for it seems patent that the history of this talented Mocker is likely to be widely referred to both in foreign and in American literature.

the winter of 1920–21 the Mocker in the Arboretum was distinctly not a permanent resident for it appeared rarely and irregularly within the park and was absent, or at least undetected, for days at a time and then was seen at different places from one end of the grounds to the other. The principal winter food of the resident bird, Siberian crab apples, appears not to be eaten by the newcomer. Added to these contrasts in behaviour is the testimony of Mr. van der Voet, who is daily afield in the Arboretum all through the open season, that from May 1920 to October 1921 he has not heard a Mockingbird sing there, an observation in accordance with my own experience.

From the above considerations and from Wright's and Early's articles, I think we may safely conclude that the Resident Mocker, at least as far as continuous residence in the Arboretum is concerned, was first observed there on November 24, 1914, by Mr. Faxon, and was last heard there by Mr. Early on July 10, 1920, and was therefore, a permanent resident for five years and a little over seven months. It is not to be inferred from above that I have knowledge of the death of the bird for such is not the case. It is well within the realm of possibility that he may again take up his residence in the Arboretum and add still other songs to the following phenomenal list of imitated songs and calls.

Mr. Wright has enumerated fifty-one species of birds whose songs or calls were heard imitated and recognized by him. An inspection of this impressive list shows that several calls of some species were heard mimicked. For example, he writes of the Blue Jay that "All its various voicings" were imitated, p. 391. Not knowing all the various voicings of this bird I cannot know how many songs or calls Mr. Wright had in mind, although I have heard the Mocker give six different calls of the Blue Jay in the space of a few minutes and will, therefore, use this number in estimating the total number of songs and calls of the fifty-one species reported by him and such other species as I am personally able to add to his list, plus three or four from other observers. (See tabulation.)

In considering the history of this bird it is natural to inquire where he was probably born and raised and how he obtained the necessary contact with singing birds to enable him to learn such

an extensive and varied list of songs and call notes. While chiefly a bird of the Austral Zones, the Mocker also nests sparingly in the Transition Zone. Of the five characteristically southern species imitated, the Carolina Wren is not known to nest in Massachusetts; the Yellow-breasted Chat infrequently nests here; and the Cardinal is on record as having nested but once in the state. The White-eyed Vireo and the Mourning Dove are only very locally fairly common summer residents, but do not nest in the Arboretum or its vicinity and in fact probably seldom visit it, so that a knowledge of the songs and calls of these species was certainly acquired elsewhere and presumably well south of New England, very likely in the Upper Austral Zone. Most of the songs imitated could, however, have been heard while the Mocker resided in the Arboretum and Mr. Wright noted the growing proficiency in the bird's mocking powers during its residence here. The bird's phenomenal ability to acquire and remember songs and calls is shown by his knowing the song of the Ruby-crowned Kinglet and several calls of the Olive-backed Thrush, birds which tarry only a short time and sing little in this region as they pass through in migration.

My own observations and those of others show that the fruits of the following plants have formed an important part of the Mocker's diet while he has lived in the park:

Pokeweed (*Phytolacca decandra*).
Juneberry (*Amelanchier canadensis*).
Hop Hornbeam (*Ostrya virginiana*)
Barberry (*Berberis*, various species).
Inkberry (*Ilex glabra*).
Black Alder (*Ilex verticillata*).
Highbush Cranberry (*Viburnum opulus*).
Siberian Crab Apple (*Pyrus baccata*).
Corktree (*Phellodendron chinense*).

In order that this bird's record as a mocker may be easily consulted, I have prepared a table giving a list of all the birds imitated by him, both their songs and their calls, which includes the fifty-one species given by Mr. Wright and seven additional birds that have been heard mimicked by other reliable observers. By interviews and correspondence I have come into possession of pertinent information regarding this Arboretum bird from a number of the local observers who have furnished, among other

TABULATION OB BIRDS IMITATED BY THE "RESIDENT MOCKER" OF THE ARNOLD ARBORETUM. LISTED IN THE ORDER OF THE 'CHECK-LIST OF N. A. BIRDS' (THIRD EDITION).

Name	Songs (Wright)	Calls (Wright)	Authority	Also Reported by	Remarks*
Black Duck (*Anas rubripes*).....			Jessie E. Kloseman		Craking call.
Bob-White (*Colinus v. virginianus*....		1	H. W. Wright	Annie W. Cobb	"Scattered" (sic) call.
Ring-necked Pheasant (*Phasianus torquatus*)			C. H. Early		No number in check list. Call note.
Mourning Dove (*Zenaidura macroura carolinensis*)		1	H. W. Wright		"Coo."
Red-shouldered Hawk (*Buteo l. lineatus*)		1	"	Mrs. M. M. Kaan, C. L. Whittle	
Sparrow Hawk (*Falco s. sparverius*)...		1	"	L. R. Talbot, C. H. Early, Mrs. M. M. Kaan, C. L. Whittle	"Killy-Killy."
Cuckoo (*Coccyzus* sp?).....		1	"		Species not given.
Belted Kingfisher (*Ceryle alcyon*).....		1	"		"Rattle" notes.
Hairy Woodpecker (*Dryobates v. villosus*)		1	"		
Downy Woodpecker (*Dryobates pubescens medianus*)	1	1	"	Annie W. Cobb, C. L. Whittle	
Flicker (*Colaptes auratus luteus*).....	1	1	"	E. E. Caduc, Mrs. M. M. Kaan, Annie W. Cobb, C. L. Whittle	"Song and Flicking."
Whip-Poor-Will (*Antrostomus v. vociferus*)	1		"	Annie W. Cobb	
Nighthawk (*Chordeiles v. virginianus*).		1	"	Margaret Bradbury	
Kingbird (*Tyrannus tyrannus*).....	1		"	L. R. Talbot, C. E. Clark, Annie W. Cobb	Call (Miss Cobb)

* Quotation marks indicate matter from Mr. Wright's article or from his personal notes.

Name	Songs (Wright)	Calls (Wright)	Authority	Also Reported by	Remarks*
Crested Flycatcher (*Myiarchus crinitus*)		1	H. W. Wright	Annie W. Cobb	Song
Phoebe (*Sayornis phoebe*)	1		"	L. R. Talbot, Edith McL. Hale, I. P. Gammon Jr., Mrs. M. M. Kaan, Florence Nelson, Annie W. Cobb, C. L. Whittle	Call (Miss Cobb)
Chebec (*Empidonax minimus*)			C. L. Whittle		Song
Blue Jay (*Cyanocitta c. cristata*)		2	H. W. Wright	L. R. Talbot, C. H. Early, E. H. Atherton, Annie W. Cobb, Edith McL. Hale, C. E. Clark, I. P. Gammon, Jr., E. E. Caduc, Mrs. M. M. Kaan, C. L. Whittle	"All the voicings of the Blue Jay" calls (Mrs. Kaan), one, Ta-Lee-dle; six calls (C. L. Whittle).
Crow (*Corvus b. brachyrhynchos*)		1	"	Annie W. Cobb, C. L. Whittle	
Starling (*Sturnus vulgaris*)		1	"	L. R. Talbot, E. E. Caduc	
Red-winged Blackbird (*Agelaius p. phoeniceus*)		2	"	Annie W. Cobb, Mrs. M. M. Kaan, L. R. Talbot, C. L. Whittle	Song (Miss Cobb)
Meadow Lark (*Sturnella m. magna*)		2	H. W. Wright	Mrs. M. M. Kaan, Annie W. Cobb	Song heard by Miss Cobb. "Rattle call."
Baltimore Oriole (*Icterus galbula*)	1	1	"	L. R. Talbot, Annie W. Cobb C. L. Whittle	"Song and chatter call" Whistle (Whittle).
Bronzed Grackle (*Quiscalus q. aeneus*)		1	"	Mrs. M. M. Kaan	
Purple Finch *Carpodacus p. purpureus*)			L. R. Talbot		Song
House Sparrow (*Passer d. domesticus*)		2	H. W. Wright	C. H. Early	Not in check list.
Chipping Sparrow (*Spizella p. passerina*)	1		"	Annie W. Cobb, C. H. Early	Call (Miss Cobb) "Trill."
Field Sparrow (*Spizella p. pusilla*)	1		"		
Junco (*Junco h. hyemalis*)			C. L. Whittle		Song

* Quotation marks indicate matter from Mr. Wright's article or from his personal notes.

Name	Songs (Wright)	Calls (Wright)	Authority	Also Reported by	Remarks*
Song Sparrow (*Melospiza m. melodia*)	1		H. W. Wright	C. H. Early, Mrs. M. M. Kaan	
Chewink (*Pipilo e. erythrophthalmus*)..	1	1	"	L. R. Talbot, C. H. Early, C. E. Clark, Edith McL. Hale, Mrs. M. M. Kaan, Annie W. Cobb, C. L. Whittle	2 songs (Whittle)
Cardinal (*Cardinalis c. cardinalis*)....	1		"		
Rose-Breasted Grosbeak (*Zamelodia ludoviciana*)	1		"	Mrs. M. M. Kaan, Annie W. Cobb	
Scarlet Tanager (*Piranga erythromelas*)	1	1	"		"Chip-Chur."
Cliff Swallow (*Petrochelidon l. lunifrons*)		1	"		
Barn Swallow (*Hirundo erythrogastra*)	1		"		
Tree Swallow (*Iridaprocne bicolor*)....	1		"		
Northern Shrike (*Lanius borealis*)....		1	"		"Whistle."
Red-eyed Vireo(*Vireosylva olivacea*)...	1		"	Annie W. Cobb	
Warbling Vireo (*Vireosylva g. gilva*)...	1		"	Edith McL. Hale, C. L. Whittle	
Yellow-throated Vireo (*Lanivireo flavifron*)	1		"		
White-eyed Vireo (*Vireo g. griseus*)...	1		"		
Yellow Warbler (*Dendroica a. aestiva*)	1		"	C. H. Early, Annie W. Cobb	Call (Miss Cobb)
Oven Bird (*Seiurus aurocarpillus*).....	1		"		"Teacher Song."
Yellow-breasted Chat (*Icteria v. virens*)			C. L. Whittle		Call
Catbird (*Dumetella acrolinensis*).....	1	1	H. W. Wright	C. H. Early, E. H. Atherton, E. E. Caduc, Florence Nelson, Mrs. M. M. Kaan, Annie W. Cobb, C. L. Whittle	
Brown Thrasher (*Toxostoma rufum*)	1		"	C. H. Early, E. H. Atherton, E. E. Caduc, Mrs. M. M. Kaan, Annie W. Cobb, C. L. Whittle	

* Quotation marks indicate matter from Mr. Wright's article or from his personal notes.

Name	Songs (Wright)	Calls (Wright)	Authority	Also Reported by	Remarks *
Carolina Wren (*Thryothorus l. ludovicianus*)	1		H. W. Wright		
House Wren (*Troglodtyes a. aedon*)....	1		"		
White Breasted Nuthatch (*Sitta c. carolinensis*)	1	1	"	E. E. Caduc, C. L. Whittle	
Chickadee (*Penthestes a. atricapillus*)..	1	1	"	L. R. Talbot, E. E. Caduc, E. Edith M. S. Hale, Annie W. H. Atherton, C. E. Clark, Cobb, I. P. Gammon, Jr., C. L. Whittle	"Phebe" and Dee dee Call.
Ruby-crowned Kinglet (*Regulus c. calendula*	1	1	"		
Olive-backed Thrush (*Hylocichla ustulata swainsoni*)		3	"		"Pip and Querulous." Calls.
Robin (*Planesticus m. migratorius*)....	1	1	"	L. R. Talbot, C. H. Early, E. H. Atherton, C. E. Clark, I. P. Gammon, Jr., Florence Nelson, Annie W. Cobb, C. L. Whittle	"Cackle Call."
Bluebird (*Sialia s. sialis*).....	1		"	L. R. Talbot, E. E. Caduc, Mrs. M. M. Kaan, C. L. Whittle	
Canary (*Fringilla canaria*).....	1		"	Annie W. Cobb	
Bantam.....	1	2	"	Annie W. Cobb	"Bantamfowl's barnyard voicing." "Crow."
Chicken.....			J. B. Brainerd	L. R. Talbot	Peep (Brainerd).
Frog.....		1	H. W. Wright		"Gutteral Roll."
Cricket.....		1	"		"Chirp."

* Quotation marks indicate matter from Mr. Wright's article or from his personal notes.

matters, the several imitated songs added to Mr. Wright's list. These birds are the Purple Finch (L. S. Talbot), Ring-necked Pheasant (C. H. Early), the Black Duck (Jessie E. Kloseman) and the common chicken (J. B. Brainerd). I can personally add the songs or calls of the Chebec, Junco and the Yellow-breasted Chat. That Mr. Wright should have heard and identified fifty-one of the fifty-eight species known to be mimicked, indicates how thoroughly the bird was studied by him in the field.

Songs and calls were not the only forms this bird's mocking abilities assumed, for according to Mr. C. E. Clark (personal communication), in imitating the Kingbird's notes, the bird would often mount into the air and on quivering wings deliver the notes in true Kingbird fashion. Mr. Early also mentions seeing the bird turn sommersaults in the air on one occasion while it was exhibiting its powers as a mimic. Flight singing and other ecstatic courtship movements are not uncommonly indulged in by this species, but I find no other mention in ornithological literature of its turning somersaults, so that it is not unlikely in this case that the bird was copying the performances of the Tumbler Pigeon.

Part of my purpose in gathering the data contained in the tabular list was to obtain confirmation as far as possible of the observations of Mr. Wright, not that there is any doubt as to the accuracy of his work; but where a record exists so astonishing as this Mockingbird's, it is well to have it as complete as possible by having it verified in detail by independent observers. Of the fifty-one birds enumerated in Mr. Wright's article, thirty-three have been confirmed by the records of other competent observers and such confirmations range from one to nine for the different species. The number of independent observers who have furnished confirmation is thirteen. (See table).

The Resident Mocker's record of imitated bird songs, calls and other sounds stands as follows:

Bird songs imitated	39
Birds calls imitated	50
Other sounds (frog and cricket)	2
Total imitated sounds	91

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NOTES ON SOME LABRADOR BIRDS.

BY HARRISON F. LEWIS.

Plate XIX

As a part of the enforcement of the Migratory Birds Convention Act by the Department of the Interior, Dominion of Canada, I visited the southern coast of the Labrador peninsula during the summer of 1921, travelling from the extreme western end of that coast to Blanc Sablon, on the Straits of Belle Isle, inspecting and protecting the sea-bird colonies, and overseeing the work of the Dominion Bird Officers stationed throughout the region. Certain of the observations made on this journey appear to be sufficiently valuable to be worthy of record.

My itinerary was as follows: Leaving Quebec by the steamer "North Shore" on June 3, I entered Labrador, at the "point where the fiftieth parallel of latitude strikes the coast a short distance to the west of the Bay of Seven Islands" (Townsend[1]), on the afternoon of June 4. I debarked at Mingan on June 6. Leaving there on June 13, I travelled, chiefly in small motorboats, and with frequent delays, to Blanc Sablon, on the eastern boundary of the Dominion of Canada, where I arrived on July 12. I returned in a motorboat as far as Harrington, sailed from Harrington on the steamer Aranmore on July 28, passed the southwestern boundary of Labrador on the night of July 29, and debarked at Quebec on July 31.

The fact of chief importance brought out by the observations made is that the breeding sea-birds of this coast are markedly more numerous than recent literature on the subject would lead one to suppose. Not only has there been a noticeable increase in their numbers in the past few years, due to the protection given them in Canada and the United States by the Migratory Birds Convention, but the unanimous testimony of the residents of the Labrador coast is to the effect that, in spite of the awful

[1] 'In Audubon's Labrador,' 1918, p. 32.

destruction that has taken place among these birds, they were never actually as scarce as has been reported. There is every reason to expect them to continue to increase as long as the present protection is continued. A total of 79 species was observed in life by me in Labrador.

At the kind suggestion of the Ornithologist to the Canadian Geological Survey, Mr. P. A. Taverner, I have appended to my own notes a few notes of interest, relating to Labrador birds, and based upon specimens in the possession of the Victoria Memorial Museum, Ottawa.

I am much indebted to Dr. Charles W. Townsend for reviewing the manuscript of this paper.

1. **Fratercula arctica arctica.** PUFFIN.—One Puffin was seen on June 7 near the Perroquet Islands of Mingan. On June 13, at Bald Island, near Betchewun, I saw about 20 Puffins, and, in a hasty walk over the island, found 6 or 7 Puffin burrows. This colony appears to have decreased very much since 1909, when Townsend and Bent[1] "found about 150 pairs" of Puffins there. I was repeatedly informed from different sources that the largest colony of Puffins on the entire Canadian Labrador coast was on islands near Wolf Bay, and I saw a few Puffins as I rapidly passed that vicinity on June 26. On the St. Mary's Islands on July 5 I actually saw about 200 Puffins. Probably not less than 250 pairs of these birds breed there. I was reliably informed that a few Puffins still breed on Treble Hill Island, near Great Mecattina. The famous colony of Puffins on Perroquet Island, at Bradore, is still very large and thriving. Mr. R. T. Christie, who was camped near this island as Dominion Warden during the summer of 1921, estimated the number of Puffins there as about 50,000 and stated that early in the season, before incubation caused at least one-half of the birds to be always out of sight in the burrows, the entire side of the island toward him was white with them each evening at sunset, when all had returned from the day's fishing. On July 10, late in the afternoon, I estimated that I saw about 12,000 Puffins at this island, which would mean that, including the incubating birds, at least 20,000 to 25,000 Puffins were nesting there. There may be more, as, with such large numbers, exact estimates are impossible, and I have preferred that any error in my figures should be on the side of conservatism. The fact that Townsend and Allen, who passed this island in 1906, say[2] of the Puffins seen there, "There were at least 500 of them, perhaps many more," and that Townsend says[3] of his visit to the island in 1915. "The birds were

[1] 'Additional Notes on the Birds of Labrador,' Auk, Vol. XXVII, No. 1, p. 7.
[2] 'Birds of Labrador,' Proc. Bost. Soc. Nat. Hist., Vol. XXXIII, p. 303.
[3] 'In Audubon's Labrador,' 1918, p. 239.

noticeably less in number than they were when I passed the island in 1906," is readily explainable. I visited the island on July 10, 11, 12, and 14, and found that at times, in the middle of the day, when conditions for fishing were good, not more than 100 Puffins remained in sight near the colony. I saw Puffins, doubtless from this island, fishing as far as twenty miles away. Mr. R. T. Christie informed me that he estimated that on Greenly Island, which is a few miles south of Perroquet Island, and which he visited frequently, though I did not go there, the number of nesting Puffins was about one-half of the number nesting on Perroquet Island.

2. **Cepphus grylle.** BLACK GUILLEMOT.—Generally distributed from Mingan to Old Fort. Average number seen in one day's cruising, 19; largest number seen in one day, 47 (between Mingan and Betchewun).

3. **Uria troille troille.** MURRE.—While this species is not now known to breed on the Labador coast west of Natashquan, there are several colonies between Natashquan and Blanc Sablon which, with present protection, may again resume the appearance which they had when Audubon visited them. Dr. C. W. Townsend visited in 1915 a colony of about 2000 Murres at Outer Island, off Canoncliou Bay,[1] and another large colony at Gull Island, off Cape Whittle.[2] Circumstances prevented my visiting either of these colonies in 1921, but I have no reason to think that they are not in a flourishing condition. On Black Duck Island, a few miles east of Wapitagun, I found about half-a-dozen pairs of Murres on June 28. I estimated that, at St. Mary's Island, on July 5, I saw about 300 Murres. On these islands the Murres engaged in incubation are hidden in great crevices in the rocks, and, during the day, most of their mates are away fishing, so that I saw a comparatively small part of the colony. Probably more than 1000 pairs of Murres breed there. On Perroquet Island, at Brador, I saw, on July 11 and 14, about 20 Murres, and as the incubating birds are hidden on this island also, the total number breeding there is probably more than 40 pairs. I received reliable reports of a large Murre colony at The Bluff, between Romaine and Canoncliou Bay, of another on one of the Mutuanne Islands, near St. Mary's islands, and of a small colony on Treble Hill Island. It is said that, on the Murre Rocks, near Mecattina Harbor, about 400 Murres still breed. "Ringed" Murres were seen at Black Duck Island and at St. Mary's Island. They constituted about 25% of the total number of Murres seen, and, as far as I could discover, showed no tendency whatever to segregation.

4. **Alca torda.** RAZOR-BILLED AUK.—Mr. A. C. Bent stated in 1919, "A few pairs of Razor-billed Auks may still breed on some of the islands off

[1] "In Audubon's Labrador," Auk, Vol. XXXIV, No. 2, p. 140.
[2] l. c., p. 141.
[3] "Life Histories of North American Diving Birds," Bull. 107, U. S. Nat. Mus., p. 302.

the southern coast of Labrador . . . , but the only colony of any size still remaining is on that impregnable sea-birds' stronghold, Bird Rock." Unfortunately Mr. Bent himself had never visited the Labrador coast between Natashquan and Bonne Esperance, and I am sure that he, as well as others, will know with pleasure that conditions on those two hundred and twenty-five miles of coast have never been such as to support his statement quoted above. The status of the Razor-billed Auk in that region in 1915 is indicated by the following published statements of Dr. C. W. Townsend: "the waterways abounded in Razor-billed Auks" (near Wapitagun),[1] "There were . . . numerous Razor-billed Auks" (Derby Bay),[2] and "Razor-billed Auks were common" (Perroquet Island).[3] A few miles west of Natashquan on June 21, I saw about 40 Razor-billed Auks, and it is possible that they were breeding in that vicinity. On June 24 and 25 a few Auks were seen between Natashquan and Romaine. East of Romaine on June 26, they were much more numerous. A large colony was seen near Wolf Bay, and small colonies were passed at frequent intervals as I sailed from Wolf Bay to Harrington. On June 28 I explored four small islands of the extensive Wapitagun group, and saw two or three hundred Razor-billed Auks breeding on them. About two hundred Auks were found at Black Duck Island on the same date, and many of their eggs were seen there. Doubtless similar conditions are to be found on others of the many similar islands in this vicinity. On St. Mary's Islands on July 5, I estimated that I saw 1200 Razor-billed Auks. Not less than 1500 pairs of these birds must have been breeding there. Small breeding colonies of Auks were also reported to exist on the Murre Rocks and on Treble Hill Island. On Perroquet Island, at Bradore, the number of Razor-billed Auks seen varied from day to day, but the number seen on July 11 was estimated at 150, and it is probable that about 100 pairs of this species were breeding there.

5. **Larus marinus.** GREAT BLACK-BACKED GULL.—These wary birds continue to breed in considerable numbers along the southern coast of Labrador.

6. **Larus argentatus.** HERRING GULL.—This species breeds commonly wherever there are islands from the Bay of Seven Islands to Blanc Sablon. As its eggs and young are good eating, it has suffered much from human enemies, and is far less common than it should be in a region so well suited to its needs. It is hoped that the next few years will see a marked increase in its numbers along this coast.

7. **Larus delawarensis.** RING-BILLED GULL.—I saw a dead specimen on Black Duck Island, a few miles east of Wapitagun, but my only certain record of living birds is from the small island near Pointe au Maurier where Townsend in 1915 found[4] a colony containing some five hundred

[1] "In Audubon's Labrador," 'Auk,' Vol. XXXIV, No. 2, p. 141.
[2] l. c., p. 142.
[3] 'In Audubon's Labrador,' 1918, p. 240.
[4] 'In Audubon's Labrador,' Auk,' Vol. XXXIV, No. 2, p. 141.

individuals. I was told that this colony continued to thrive until 1921. In the spring of that year the Gulls returned to their island as usual, but after a few days nearly all of them, for some cause unknown, disappeared no one knew whither. Less than a dozen pairs remained to nest on the island where the colony had been accustomed to breed. These Gulls had been systematically robbed for many years of their first sets of eggs; they had been allowed to hatch later sets and to bring up in peace the young hatched from these. Under this treatment the colony had increased, and it was considered by residents of the vicinity to be a model of the "right way" to rob Gulls' nests. It seems possible, however, that the Gulls finally rebelled against the annually recurring unnatural drain upon their strength which this robbing involved, and that their abandonment of their old home resulted from this.

8. **Sterna hirundo.** COMMON TERN.—This is still a common breeding species from the Perroquet Islands of Mingan to the Netagamiou Islands, near Harrington. No Arctic Terns were identified.

9. **Sula bassana.** GANNET.—My records of the Gannet in Labrador in 1921 are as follows: 12 adults near Long Point of Mingan, June 7; 5 immature birds near Harrington, July 5; 3 immature birds near Mutton Bay, July 6; 2 immature birds near Natashquan, July 28; and about 10 immature birds and from 40 to 50 adults between Mingan and Thunder River, July 29. As the very small island near Mingan on which this species formerly nested is now occupied by the lighthouse, there is little hope that Gannets will ever breed there again.

10. **Somateria dresseri.** AMERICAN EIDER.—The Eider was found to be a common breeding bird from the vicinity of Mingan to the vicinity of Old Fort. On June 9, about the Birch Islands and Harbor, or Mingan, Island, near Mingan, I counted 574 Eiders, and could easily have increased this number very much without visiting additional islands had counting Eiders been my sole occupation for the day. Owing to a combination of favorable conditions, the Eiders breeding on this coast were considered by the residents to be enjoying in 1921, one of the most successful breeding seasons within memory. On June 24 I found an Eider's nest with 6 eggs on a bush-covered rock in the midst of the second falls of the Kegashka River, more than a mile from the sea. In an expansion of the river nearby, I saw 7 female Eiders swimming about. Residents of the vicinity informed me that considerable numbers of young Eiders descended this river each autumn. It would be interesting to know just how and at what age the young Eiders from the nest which I found left their birth-place, situated as it was in the midst of a foaming cataract.

11. **Branta bernicla glaucogastra.** BRANT.—A flock of 200 and another of 25 were seen flying westward at Mingan, June 9. A single bird was seen at Eskimo Point, June 13.

12. **Botaurus lentiginosus.** AMERICAN BITTERN.—The familiar "pumping" of a male was heard at close range from a small swamp near the beach three miles west of Mingan on June 6, 8, and 9.

13. **Lobipes lobatus.** NORTHERN PHALAROPE.—A flock of about 1000 was seen on the surface of the water near the Perroquet Islands of Mingan on June 7.

14. **Buteo borealis borealis.** RED-TAILED HAWK.—One was seen near Mingan on June 11 and two togeher near Piashte Bay on June 16. I was able to observe clearly the broad red tail of the Mingan bird and that of one of the Piashte Bay birds.

15. **Falco columbarius columbarius.** PIGEON HAWK.—On June 22, I found, a few rods west of the first falls of the Little Natashquan River, a rather unusual nest of this species. It was on the ground, among the Reindeer lichen, on the summit of a small knoll of gentle slope. A black spruce "tree" which had grown here for many years, until it had attained a height of about 3 feet and a width of 6 feet, had died, apparently two or three years previously, leaving a confused snarl of stiff dead limbs. The Pigeon Hawks had placed their nests beneath this shelter. The nest, which was about 6 inches across and 1 inch deep, was a depression in the soil, here composed of sand and rotten wood, and was lined with a few small scales of bark, picked by one or both of the Hawks from the base of the trunk of the sheltering "tree," as was clearly indicated by the recent scars on that trunk. Four eggs rested on these bits of bark. One Hawk flew from the nest when I approached it, and it and its mate scolded me vigorously, charging repeatedly to within a few feet of me, as long as I remained in the vicinity. A nest of the Pigeon Hawk in a very similar situation in Newfoundland has been described by W. J. Brown.[1]

16. **Chordeiles virginianus virginianus.** NIGHTHAWK.—One was heard calling in the dusk at Piashte Bay on June 14.

17. **Nuttallornis borealis.** OLIVE-SIDED FLYCATCHER.—One was seen and heard repeatedly near Mingan on June 11, 12, and 13, and another was observed near Piashte Bay on June 16.

18. **Empidonax traillii alnorum.** ALDER FLYCATCHER.—At Lake Patterson, near Mingan, on June 11, two Alder Flycatchers were heard calling (or "singing.") repeatedly from the depths of a dense and extensive growth of alders. I was able to identify their notes with certainty, as years of residence in Nova Scotia and Quebec had made me very familiar with the notes of the Alder, Yellow-bellied, and Least Flycatchers, and I was hearing numerous Yellow-bellied birds every day. The harsh "Wa-aaow," of the Alder Flycatcher is quite unlike the "Chebec," of the Least or the "Jelet," of the Yellow-bellied. I made repeated attempts to see these two Alder Flycatchers, not desiring to present a record from voice alone if it could be avoided, but the alders were so luxuriant and the birds were so shy that I could not obtain even a glimpse of them. The

[1] 'Unusual Nesting Site of the Pigeon Hawk in Newfoundland,' Ottawa Naturalist, Vol. XXVI, p. 70.







PHOTOS BY HARRISON F. LEWIS. PUBLISHED BY PERMISSION CANADIAN NATIONAL PARKS

2. Common Murre rushing forth from nesting crevice. St. Mary's Islands, P. Q. July 5, 1921.
2. Eider Ducks courting. Greater Birch Island near Mingan, P. Q. June 9, 1921.
3. Puffins on ledge. Perroquet Island, Bradore, P. Q. July 10, 1921.

only previous Labrador record of this species appears to be that of Audubon.[1]

19. **Sturnus vulgaris.** STARLING.—A skin of this species was shown to me at the home of Mr. F. W. Salsman, at Betchewun, where it was taken. Under date of August 31, 1921, Mr. Salsman has written to me that this bird was killed "four years ago in April." This is the first Labrador record of the Starling.

20. **Quiscalus quiscula aeneus.** BRONZED GRACKLE.—At the home of Mr. F. W. Salsman, at Betchewun, I was shown the skin of a Bronzed Grackle which had been taken at Betchewun. In his letter of August 31, 1921, Mr. Salsman states, "The Bronzed Grackle I shot near the last of April of this year." Mr. J. L. DeVany, Dominion Bird Officer, has informed me that he saw two or three Bronzed Grackles at Eskimo Point in the first half of May, 1921.

On searching the literature on the subject, I found that several authors stated that the range of the Bronzed Grackle extended to Labrador, but I did not discover any definite published record for the species in that area. However, Dr. Harry C. Oberholser, in response to my inquiry, very kindly informed me, in a letter dated September 22, 1921, that "All the statements of the occurrence of this bird in Labrador are based on the record of a Mr. Weiz, who found the bird at Okak, and recorded it as Quiscalus niger in the 'Proceedings' of the Boston Society of Natural History, vol. X, 1865, p. 267."

After consulting this record, I desire to point out:

(1). That "*Quiscalus niger*" is the only species of Blackbird recorded in Labrador by Weiz.

(2). That Townsend and Allen state[1] that the Rusty Blackbird, *Euphagus carolinus* is a common summer resident throughout Labrador except in the Arctic zone. They quote Turner as saying that it is common and breeds at Fort Chimo, which is slightly farther north than Okak, where Weiz resided. They quote Low as saying that it is common throughout the interior (of the peninsula). They give several other records. As Weiz lived at Okak for seventeen years, it would be rather strange if he observed no Rusty Blackbirds in that time, as we must suppose to be the case if his "Q. niger" refers to the Bronzed Grackle.

(3). Okak is far to the northward on the Atlantic Coast of Labrador. If the Bronzed Grackle reached Labrador at all, it would be reasonable to expect it first in the southern or the southwestern part of the peninsula, rather than in the vicinity of Okak.

(4). I have not found "*niger*" among the synonyms of *Quiscalus q. aeneus*, but Ridgway gives,[2] in the synonymy of the Rusty Blackbird:

[1] 'Ornithological Biography,' 1839, Vol. 5, p. 289.
[1] 'Birds of Labrador,' Proc. Bost. Soc. Nat. Hist., Vol. XXXIII, p. 389.
[2] 'Birds of North and Middle America,' Part II, p. 248.

[*Scolecophagus*] *niger* Bonaparte Consp. Av., i, 1850, 423.

[*Scolecophagus*] *niger* Cabanis, Mus. Hein., i, 1851, 195.

(5). There is no other record of the Bronzed Grackle in any part of Labrador until 1921, when the species occurred in the southwestern part of the peninsula, as noted above.

Therefore I conclude that Weiz's record of *Q. niger* at Okak cannot be considered a valid record of the Bronzed Grackle, and that the first Labrador record for the latter bird is that of the specimen taken by Mr. Salzman. Dr. Oberholser, in a letter dated October 25, 1921, has expressed his complete agreement with these conclusions.

21. **Spinus pinus pinus.** PINE SISKIN.—This species was found to be common all along the coast, from Mingan (June 8) to Bradore (July 13). It was last seen at Harrington on July 27. It was as common in treeless regions as in those where forests grew.

22. **Melospiza melodia melodia.** SONG SPARROW—To my great surprise, I found a Song Sparrow among the bushes in a sheltered swamp on Bald Island, between Long Point and Mingan, on June 7. I saw the bird and its characteristic markings clearly at close range through binoculars (x3) and heard it sing several times. On June 11, at Long Point of Mingan, I distinctly heard a Song Sparrow sing in a nearby field, but was unable to take time to look for it. At Natashquan, between June 18 and June 24, I noted five male Song Sparrows, apparently settled on their nesting grounds for the season, as follows: One near steamboat wharf, one near dwelling-house of Robin, Jones, and Whitman's storekeeper, one near telegraph station, one near marsh on lower course of Little Natashquan River, and one near Post Office. Most of these were heard repeatedly and sometimes seen at a distance, but the one near the marsh was seen clearly and studied carefully on June 22. The greatest surprise of all was at Harrington, when, on June 29, in a thicket of bushes and small trees near the cemetery on Hospital Island, a Song Sparrow was heard singing repeatedly. I was able to devote a short time to an attempt to look at it, but succeeded only in obtaining a brief glimpse of it. Mr. J. L. DeVany, a Dominion Bird Officer, informed me that he noted several Song Sparrows at Eskimo Point about May 10, 1921. I have given these records in detail because, in spite of the many visits of ornithologists to this coast, the Song Sparrow has not been recorded previously from it except by Townsend[1] at Blanc Sablon. These observations therefore seem to point to an extension of the range of the Song Sparrow. I should add that I have been familiar with Lincoln's Sparrow and its song for a number of years, and that I was frequently seeing and hearing Lincoln's Sparrows during my stay in Labrador.

[1] 'In Audubon's Labrador,' Auk,' Vol. XXXIV, No. 2, p. 146.

[2] 'The Mistassini Region,' Ottawa Naturalist, Vol. 4, p. 23.

23. **Bombycilla cedrorum.** CEDAR WAXWING.—In the collection of Mr. Johan Beetz, of Piashte Bay, I saw the skins of two male Cedar Waxwings which he had taken there, one on July 12, 1915, the other on July 24, 1915. I observed a flock of four Cedar Waxwings on Ile a la Proie, near Mingan, on June, 8, 1921. They were engaged in catching low-flying insects on the stony beach. The only previous record of this species in Labrador appears to be that of Dr. A. P. Lowe[2] at Lake Mistassini.

24. **Mniotilta varia.** BLACK AND WHITE WARBLER.—At Mingan, one observed on June 11, and one on June 12. Two noted at Piashte Bay on June 16.

25. **Vermivora ruficapilla ruficapilla.** NASHVILLE WARBLER.—At Mingan, two observed on June 11, and one on June 12. Two noted at Piashte Bay on June 16.

26. **Dendroica aestiva aestiva.** YELLOW WARBLER.—In addition to specimens observed from Kegashka westward, a male in song was seen plainly at very close range near Bradore on July 13, in a dense fog.

27. **Dendroica castanea.** BAY-BREASTED WARBLER.—A singing male was carefully watched at close range with binoculars (x3) and absolutely identified in dense woods about two miles inland from Piashte Bay on June 16. I know of no previous Labrador record of this species, except that of Turner[1] at Hamilton Inlet in 1882.

28. **Dendroica virens.** BLACK-THROATED GREEN WARBLER.—In the vicinity of Mingan this species was found to be common, both on the mainland and on the forested islands, during the period from June 6 to 13. On June 16, between Piashte Bay and the first falls of the Piashte Bay River I saw two male Black-throated Green Warblers and one female, and heard four more males in song. Between Natashquan and the mouth of the Big Natashquan River, on June 23, I heard two males repeatedly sing their distinctive little songs in a small grove of spruce and fir, which, while near me, was on the opposite side of a deep, narrow slough which I was not equipped to cross. Although Townsend has stated[2], concerning the birds of this species, that "it is evident that they pass through the coastal strip and breed only in the interior," my observations recorded above would seem to indicate that a few at least of the species breed on or near the coast at least as far east as Natashquan.

29. **Seiurus aurocapillus.** OVENBIRD.—On June 6 and again on June 12 the unmistakable "Teacher, teacher, teacher" of a male Ovenbird was repeatedly heard issuing from a dense fir woods near Mingan, in which the singer remained securely hidden. Except that Stearns[3] found Ovenbirds in the interior of the Labrador peninsula, there appears to be no previous Labrador record of this species.

[1] 'List of the Birds of Labrador,' Proc. U. S. Nat. Mus., Vol. 8, p. 237.
[2] 'In Audubon's Labrador,' 1918, p. 43.
[3] 'Notes on the Nat. Hist. of Labrador,' Proc. U. S. Nat. Mus., Vol. 6, p. 116.

30. **Setophaga ruticilla.** REDSTART.—Townsend states[1] that he has not found this species in Labrador east of Piashte Bay. I was able to extend its known range in that region by observing ten individuals, including two females, between Natashquan and the mouth of the Big Natashquan River on June 23.

31. **Sitta canadensis.** RED-BREASTED NUTHATCH.—At Harrington I saw one in stunted woods on Hospital Island on July 23, and three in the same neighborhood on July 27. On the latter date one alighted on my cap, as I sat on the edge of a cliff, and remained there for about half a minute.

ADDITIONAL SPECIES

I. **Podilymbus podiceps.** PIED-BILLED GREBE.—A bird of the year (sex?), obtained by John Goddard at Bonne Esperance, P. Q., during the winter of 1915–16, the skin of which is now in the Victoria Memorial Museum, is the first of this species to be recorded from Labrador.

II. **Mareca americana.** BALDPATE.—In the Victoria Memorial Museum is a specimen in the plumage of the female, obtained at Bonne Esperance in November, 1919, by John Goddard.

III. **Nettion carolinense.** GREEN-WINGED TEAL.—The Victoria Memorial Museum possesses a specimen in the plumage of the male, taken in the autumn of 1914, near Harrington.

IV. **Spatula clypeata.** SHOVELLER.—A specimen of this species in the plumage of the male, taken at Romaine on June 1, 1915, by Michael Blais, is also in the Museum. The only previous record of the Shoveller in Labrador is that of two specimens taken near Cartwright by Dr. W. T. Grenfell in September, 1901.[2]

V. **Cryptoglaux funerea richardsoni.** RICHARDSON'S OWL.—There are two Labrador specimens (sex?) of this species in the Museum. Both were obtained by John Goddard at Bonne Esperance, one in the spring of 1916, and one in the winter of 1920–21. These are the second and the third record, respectively, of this species in Labrador.

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[1] 'In Audubon's Labrador,' 1918, p. 43.

[2] 'Birds of Labrador,' Proc. Bost. Soc. Nat. Hist., Vol. XXXIII, p. 327.

FIELD STUDIES OF THE ANATIDAE OF THE ATLANTIC COAST.*

BY LUDLOW GRISCOM.

THE Anatidae or waterfowl, including the ducks, geese and swans, constitute one of the last groups of birds with which the student of birds in life becomes familiar. This is due to several factors. First, waterfowl are confined to marshes and bodies of water, whereas, the common land birds, as the Robin for example, are widely distributed in settled country. Several species of ducks are numerically equally abundant, but the individuals are massed in a restricted environment. Secondly, for centuries waterfowl have been subjected to constant persecution as game, resulting in a great decrease of their numbers. Most important of all is the steady invasion of their breeding-grounds by civilization.

The struggle for existence has accordingly become more acute as the birds have become fewer and many of their old haunts have disappeared. By nature shy and wary these qualities have become greatly accentuated. The cleverness of Black Ducks and wild geese in eluding schemes for their destruction is proverbial. With care almost any land bird can be approached within a hundred feet, but the student may consider himself fortunate indeed if he approaches within as many yards of a duck. Many species are crepuscular or nocturnal, hiding by day in dense reed-beds or riding the water far from shore. The sea ducks are to be found almost invariably far "off shore." The writer has seen thousands of Scoters so far out at sea that they appeared as mere specks. This is probably an acquired habit, since they are fond of riding the surf in uninhabited stretches of coast.

To the beginner, therefore, the waterfowl are a source of continual discouragement. Much time is spent in the field with few results other than a note-book filled with question marks. The difficulty is greatly increased by one fact, that in popular treatises

* Presented as a thesis for the degree of Master of Arts, Cornell University, 1915. Here somewhat revised and greatly enlarged.

or bird manuals many species of ducks are omitted entirely because of their rarity, and those included are identified by means of plumage or structural characters, which in many cases cannot be employed in the field. The more technical manuals are arranged mainly for the identification of specimens in the hand, some characters of great importance in the field, but others entirely useless. Thus the subfamily *Fuligulinae* is distinguished by having a broadly lobed hind toe, but by no stretch of the imagination could this be determined in a wild bird. The inexperienced student is unable to discriminate, and accordingly unable to make use of these manuals to any great extent. Even the plumage characters have never received thorough treatment. There are only two books extant which treat the subject of field identification competently:—Hoffman's 'Guide to the Birds of New England and New York' and Eaton's 'Birds of New York.' The former is confessedly a popular treatise and most admirably adapted to its purpose. Naturally enough the rare species are omitted and "fine points" are not discussed. Eaton is the only author who has given attention to shape, manner of flight, and such other features as would aid in field identification. As is so often the case, however, this work is not within the reach of most students and cannot be carried in the field because of its physical proportions.

I. METHODS OF IDENTIFICATION.

Fortunately this family of birds exhibits a certain lack of homogeneity in external characteristics. Few groups show a greater variation in color pattern. No other order of birds except the Ralliformes is divided into so many genera in proportion to the number of species. The field characters which I have found useful for the purposes of identification fall into two groups.

(1) *Color markings*—to be used at close range under favorable conditions of light. The maximum distance at which color of plumage can be used safely is about 150 yards, very much less than that for several species. This method, is, of course, the only one which the beginner should use.

(2) *Characteristics of shape and flight, combined with color pattern.*—It is well known that experienced ornithologists, sportsmen and

the better class of baymen are able to name many species of waterfowl with certainty at great distances when color markings are more or less indistinguishable. Tricks of flight, peculiar shapes of body, and the varying amounts of white are in time noted and remembered. The ability to do this for more and more species grows with practice until finally many can be named with certainty when they appear only as black specks to the naked eye, a feat seeming little short of miraculous to the unskilled.

A much more difficult task, however, is that of passing this knowledge on to others in a way to be readily understood and, therefore, useful. It is also much easier to name a duck at a great distance than to prove the identification, without which an observation is devoid of scientific value. In the writer's experience a longer period of years was necessary to prove that certain ducks could be identified accurately at long range than to acquire the ability to do so. This was done by taking advantage of the well known habit of ducks to rise from the water against the wind and then to double back with the wind. To get just the right conditions, a flock of ducks should be approached against a strong wind in a boat. As they flush they can be identified at long range and when they double back past the boat the identification can be made positive thus supplying an excellent check. This check has been employed many times for most species mentioned in this paper.

The second difficulty, that of analyzing and defining these characteristics of shape, flight and color pattern, can be overcome only by visiting favorable localities where many species occur together either during migration or in winter quarters. Gardiner's Island and Currituck Sound are good examples. Another excellent method which aids the solution of both problems at once is the use of a blind in some pond or creek resorted to by several species. The ducks come so close that they may be identified with certainty. By flushing them the differences between them can be noted at great distances with the added advantages of comparison. What is equally important, the distance at which the various species are no longer identifiable can be determined approximately. In most cases it is astonishing how great this distance is. This method has been used successfully in many parts of the country.

A few words should be said by way of definition concerning the field characters used in this paper:—

(1) *Shape.*—The shape of waterfowl varies considerably. Those who are familiar with the common barnyard varieties can distinguish a duck, goose, swan, or even different varieties of poultry by shape alone. It is a matter of common experience. Many species of ducks differ no less decidedly from each other, though in a lesser degree. The Mergansers with their thin heads, long thin necks, and narrow bodies, can be readily contrasted with the Sea Ducks, possessing round, thick heads, short necks and stout bodies. It is not, however, to be supposed for a moment that a person observing a Merganser for the first time would at once recognize it by this characterization. Since these differences in shape are of degree only, hence purely comparative, an acquaintance with the majority of types being a prerequisite to recognizing a new one.

The length of the neck is one of the best methods of separating Anatidae into groups. In flight Swans appear to be about half head and neck, Geese and the Pintail one third, the *Anatinae* Canvasback, Scoters, and Mergansers about a quarter of the total length, and the remaining species even less.

(2) *Flight.*—This is undoubtedly the character which gives the student most trouble. It is also the most difficult of description and illustration. It is best treated under three heads:—

(a) *Shape of wings.*—The wings of the Anatidae differ to a considerable extent. Geese and swans have very broad wings; fresh water ducks, as a rule, possess a long, narrow wing, tapering gradually to a point; the sea ducks are provided with a short, broad wing which tapers rapidly to a blunt point. There are, of course, exceptions and variations in each subfamily which will be discussed later. The point to be emphasized here is the relation of shape of wing and manner of flight. The rapidity of the wing-beats, necessary to maintain a given rate of speed, is much greater in the sea ducks than in the fresh water species. In swans and geese with very broad wings, the flight is a slow flapping, rather than a rapid beating of the wings.

(b) *The arc described by the wings during a single beat.*—Flight is accomplished by raising the wings above the body and then bring-

ing them down forcibly below the body to a greater or less extent. If we can imagine the wing-tip describing a line in space, that line will obviously assume the form of an arc, since the other end of the wing is permanently attached to the body. The figure thus described will be referred to in this paper as the wing-arc. It follows that any peculiarity in flight will produce a variation in this arc. The Black Duck, for instance, rarely brings its wings below the level of the belly except when rising from the water. The arc in this case is little more than half its length in other species. The Baldpate brings its wings way below the body at the down-stroke. The Ruddy Duck raises its wings but little above the body and does not bring them very far below it. The wing-arc in the former will be very long, and in the latter very short. Once the principle of its formation is grasped, an illustration of the wing-arc of any species presents a much better mental picture than an unavoidably lengthy and involved description.

Finally the wing-arcs of all ducks appear to the eye to be at right angles to the median line of the body, with the single exception of the Old-squaw. This is very far from being actually the case. The movements of a bird's wing are very complicated, but they are so very rapid that the eye is entirely unable to distinguish them. It is not in the province of this paper to discuss the mechanics of flight or the reasons why it appears to the eye as it does. The characters used in this paper are those clearly visible to the eye, and as such the wing-arc is taken to be at right angles to the body, unless otherwise stated.

(c) *Position of the body in flight.*—This is an excellent character and is easy of accurate determination. The Mergansers, for instance, hold the bill, head, neck, and body in a straight line during horizontal flight. The Black Duck always flies with the body tipped up at the front. Nearly all ducks fly with the head higher than the body; some point the bill downwards, others hold it parallel to the direction of flight.

(3) *Color pattern.*—At any considerable distance colors resolve themselves into dark and light areas, finally even the light areas becoming dark also. Ducks are usually so far away from the observer that their colors can only be expressed in terms of dark and light. Color markings consequently reduce themselves to

color patterns, namely, the arrangement of dark and light areas for any given species. The Black Duck, for instance, is not really black at all, but appears so only a few yards away. White, unless in very small quantities, is evident at very great distances. Red and blue soon appear black. Light grays and blues appear as light areas. Yellow or buffy tints soon change to brown. Brown in strong sunlight can be distinguished from black up to a quarter of a mile, finally appearing black. With practice the color pattern of every species is easily determinable beforehand for various distances.

So much for the general lines along which these field studies of the Anatidae have been conducted. Every means to identification which the student can employ will be described. The majority of species possess several characters each, so that if conditions make the determination of one impossible, there are others equally good upon which to rely. Unless a duck is so near that every color marking can be made out, the student is advised to flush or scare up his bird if possible, as most of the characters other than color markings show in flight only. Ducks sitting on the water 100 yards from shore are almost invariably unidentifiable on a dull day. If, however, they can be made to fly away they are equally certain to leave their names behind.

It should be understood that when characters are given for any species when on the wing, the line of flight must be past the observer not away from or toward him. Certain expressions with regard to distance have been found convenient, and are employed consistently through the paper. They are as follows: "close range," from 10–150 yards; "short distance," same as the preceding; "moderate distance," 150 yards to one quarter of a mile for geese and swans; "long range," one quarter of a mile or more. The use of prism binocular glasses is taken for granted throughout the paper.

These investigations were started originally to find out how far the accurate identification of *Anatidae* could be carried, not to prove that they could be named much more easily than supposed.

II. DESCRIPTIVE.

The Anatidae of North America are divided into five subfamilies according to the 'Check-List' of the American Ornithologists' Union, a division based naturally upon structural differences. Fortunately there are characteristics of shape, size, and color which readily distinguish most of these groups in the field. The differences between the *Anatinae* and the *Fuligulinae* are comparatively slight, several species in each group varying towards the other in some of their characters.

FIELD KEY TO THE SUBFAMILIES.

A. Plumage pure white; head and neck ½ total length; wings very long and broad; size very large, length 55 inches.....*Cygninae.*

AA. Plumage never entirely white, neck ⅓ of total length or less; length under 43 inches.

a. Wing-beats slow; wings very broad; neck ⅓ of total length; size comparatively large..... *Anserinae.*

b. Wing-beats more rapid; wings not broad; neck not of striking length (except in Pintail); size comparatively small.

1. Bill, head, neck, and body held in a straight line in flight; bill long, narrow and slender; head, neck, and body very slender.....*Merginae.*

2. Bill, head, neck and body not held in a straight line in flight; bill short and comparatively stout; shape not so slender as the last.

a. Neck long; head narrow; body slender; wings narrow and tapering gradually to a point.....*Anatinae.*

b. Neck usually short and always stout; head stout and round; body stout; wings broad and suddenly pointed or else rounded; wing-beats much more rapid than in last.....*Fuligulinae.*

SUBFAMILY MERGINAE.

Three species of Mergansers occur more or less commonly in the Eastern United States. In the water at close range they can always be recognized by the narrow slender bill, and slender head and neck. In flight these characteristics are even more apparent; moreover the bird holds itself with the bill, head, neck, and body in a straight line. The flocking formation of Mergansers is also characteristic. They fly in long lines over the water; regularly, in single file. In flocks containing fifty or more birds,

there is a certain amount of bunching in the middle, but the flock is always longer than broad or deep. Mergansers fly as a rule just above the water. I have never seen a Merganser more than 150 feet in the air. Their flight and flocking habits are shared by the Scoters only, which are mostly black, while the Mergansers always show a considerable amount of white in the plumage. Finally Scoters are not nearly so slender in build as Mergansers. Members of this subfamily can be made out satisfactorily at a distance of a quarter mile or even more.

1. **Mergus americanus.** AMERICAN MERGANSER.
2. **M. serrator.** RED-BREASTED MERGANSER.

These two species can best be discussed together. Color markings alone must be used to distinguish them, as the difference in size is not sufficient. The males are readily separable. The crest of the Red-breasted is noticeable at a considerable distance even in poor light. The reddish-brown band across the breast shows even when the bird is swimming, being well above its "waterline." At any distance or in poor light it appears merely as a dark area, but as the male American never has a dark area below, this mark is useful in the field at all times. On the wing the Red-breasted shows much less white than its relative, because the bend of the wing and the outer scapulars are almost entirely black, whereas they are pure white in the American. This character is the one observable at the greatest distance. The females of the two species are very difficult to separate. The American has a dark reddish brown head and neck sharply defined from the gray or white of the adjoining areas. In the other species the reddish brown is lighter in shade and blends gradually into the adjacent areas.

A good many students are content to separate the two species by the character of the water in which the bird is found. Incredible as this may seem, there is a certain basis of truth in it, founded on the habits of these birds. The American undoubtedly prefers fresh water, rivers and lakes; the Red-breasted the ocean, and salt bays, and estuaries. Unfortunately many exceptions may possibly prove the rule, the Red-breasted Merganser being a regular migrant to all large inland bodies of water, and the American frequently noted in bays and estuaries, though rarely in the ocean itself. The student must realize then that a Merganser on a river or lake is not necessarily an American, and similarly a flock of birds in some bay are not necessarily to be considered the Red-breasted species.

3. **Lophodytes cucullatus.**—HOODED MERGANSER.

This rather uncommon species is found in all types of aquatic environment, and hence associates frequently with its larger relatives. On such occasions its much smaller size and the darker coloration of both sexes readily distinguish it. Should the birds be alone on some quiet mill-pond

or estuary, the adult male can be identified by its bushy, black and white crest, the large amount of black in the wings, and the two bars of black on the sides of the breast in front of the wing. The female and immature have the back dark grayish-brown and not gray as in the other two species, a distinction which distance accentuates; the head is also dark grayish-brown and not reddish-brown in marked contrast to the head. In rapid flight the exact proportion of light and dark does not show well, but the male differs from its relatives in the wholly black appearance of the wing. which has a small white mirror only; the female can only be identified by its smaller size.

SUBFAMILY ANATINAE.

Eleven species of this subfamily occur more or less regularly in the eastern United States, but only one, the Black Duck, is abundant and generally distributed. Most of them are now uncommon in most of the North-east. Three are rare everywhere; the European Widgeon while a rare visitor to North America, is likely to occur anywhere with Baldpate in localities suited to that species; the Shoveller and Gadwall are western species, regular winter visitors to the Southern States only, and very rare north of Maryland, along the Atlantic Coast. The Wood Duck, owing to persistent persecution and the reclamation of its breeding grounds, is now common only in the South. In the Montezuma Marshes of central New York one Teal is seen for every thousand, twenty-five years ago. Several years are usually required to meet all the members of this subfamily, unless the student can reach a few chosen localities.

Most of the species can, however, be recognized at considerable distances by marked characteristics of shape and flight. The bill is relatively longer than in Sea Ducks, deeper and much broader than in Mergansers. The neck is slender, never stout, and from $\frac{1}{3}$ to $\frac{1}{2}$ the total length, when outstretched in flight. The Scoters (Sea Ducks) have rather slender heads and long necks, but the neck is much stouter, as is also the body, which is slender in the *Anatinae.* The wings are long, narrow and sharply pointed, never rounded and abrupt. In flight the members of this subfamily never assume an attitude like that of the Mergansers, but rather one in which the neck is inclined upwards from the body, and the head slightly downward thus forming an angle with the neck. The wing-beats are slow compared with Sea Ducks, the wing-arc

being very long. The Mallard and Black Duck are two exceptions. In these the wing-arc is short due to the rapid wing-beats, but the wings are raised high above the body during the up-stroke, thus differing markedly from Sea Ducks. All *Anatinae* rise from the water very abruptly or steeply, at an angle of 75–80°.

4. **Anas platyrhynchos.**—MALLARD.

The male Mallard at close range can be confused with no other species, whether sitting on the water or on the wing. When flying directly away from the observer, the white tail feathers and black tail coverts are very conspicuous and furnish an excellent distinguishing mark. The female Mallard most closely resembles the Black Duck but is of a light chocolate brown, instead of dark blackish brown, with a conspicuous white stripe in the wing. These characters can frequently be made out at the distance of a quarter mile in strong sunlight.

On the wing this species and the Black Duck share the peculiar wing-arc described above. At long range the white underparts of the male show as a light area even in poor light, and the paler coloration of the female is very noticeable, as mentioned above. The female also bears a superficial resemblance to the female Baldpate, many students believing that the white belly of the latter must be made out to distinguish the two species. As a matter of fact there is much more white in the wing of the Baldpate, and at any distance the peculiar flight of the Mallard is noticeable. Moreover it has a much stockier build.

5. **Anas rubripes.**—BLACK DUCK.

The Black Duck, owing to its uniform dark coloration and peculiar flight, is distinguishable at any distance. The white lining of the wings is an excellent character which is obvious at a distance of a quarter mile in good light. The thin line of white on the tips of the secondaries is not visible for more than a hundred feet, and is indistinguishable when the bird is on the wing. There is, therefore, no danger of confusing it with a female Mallard, which has a conspicuous stripe of white in the wing.

When Black Ducks are startled by a sudden approach or when in some manner suspicion is aroused, the head and neck are stretched straight up in the air to the fullest possible extent, and the bird for several seconds is absolutely motionless. All Anatinae, when alarmed, raise the head to look about, but no other species comports itself in quite the same way as the Black Duck.

Encamped on the bank of a pond in some marsh during the migrations, the student is often awakened by the whirring of wings, the quacking and whistling of various Anatinae which appear as mere shapeless shadows. Their notes identify them. The male Mallard and Black Duck have a low reedy quack, *kwek-kwek-kwek-kwek*, given much more rapidly than the resonant *quack, quack, quack*, of the females.

6. **Anas fulvigula.**—FLORIDA DUCK.

This species is easily distinguishable from the Black Duck in life. The lack of streaks on the buffy throat gives this part a much lighter appearance at a distance than the rest of the underparts or the head, thus affording a contrast in color pattern which is noticeable in a good light at a considerable distance. The two races of this species are, of course, not distinguishable in life.

7. **Chaulelasmus streperus.**—GADWALL.

This species is the rarest of its subfamily in the North-east, and I doubt if it is really common anywhere in Eastern North America east of the Mississippi. The male is quite unmistakable at close range. At a distance it has a gray effect, the wing with a large white and dark area. The female is the most difficult of its subfamily to identify. The color pattern is precisely like that of the Baldpate. At close range the absence of a vinaceous tone is obvious. At a distance in flight this distinction becomes impossible, and it can then be distinguished only by its shape, which is like that of a Pintail, slenderer and more rakish. The conspicuous white in the wing will distinguish it from the latter. In most parts of the Eastern United States it should be identified with the greatest care and caution.

8. **Mareca penelope.**—EUROPEAN WIDGEON.

This beautiful species is by no means so rare as was formerly supposed in the Eastern United States. On Currituck Sound, North Carolina, where Baldpates winter in great numbers, this species is well known to the better class of local gunners who call it the Red-headed Widgeon. It is likely to occur wherever Baldpates are particularly abundant.

In size, shape, and flight characters it closely resembles its relative, and is indistinguishable from it on the wing at any distance. At close range on the water, however, the male differs from any other species in its cinnamon red head and cream buff crown. The female is indistinguishable in the field from the female Baldpate.

9. **Mareca americana.**—BALDPATE.

Like all the members of this subfamily, the male Baldpate is unmistakable at close range. The female resembles that sex of the Mallard, but is much paler in general color and smaller. The amount of white in the wing is also much greater. When tipping for food Baldpates leave only the rear end out of the water. On such occasions the pure white of the belly is sharply contrasted with the black under tail-coverts, a very striking field mark.

On the wing even at close range the white top of the head in the male is usually invisible and the thick speckling of black elsewhere on the head give it a dark appearance. The whole fore-part of the wing is, however, snowy white and very conspicuous, this mark alone serving to distinguish it from any other member of the family. The body is much paler in coloration than the Mallard and is strongly vinaceous in tint.

The lower breast and belly are white. The last two characters serve also to distinguish the female very readily.

On the wing at long range this species is readily determinable by its shape which is noticeably slenderer than the Mallard and Black Duck. This shows especially in the body which is not so deep or so stout. The flight is also diagnostic, the wings being brought way below the body in the down-stroke, thus making the wing-arc a long one. The bird seems to rise from the water, when flushed, with much less effort than the other two species.

The note of the male is a mewing whistle which might be rendered as *whew, whew, whew.* More rarely there is another note, a *fi-éw,-whew,* with a pronounced burr in it, making it suggest a common call note of the Pine Siskin to a surprising extent. The female utters a loud cry which Eaton renders *kaow, kaow.* Unlike the Black Duck, the female is not particularly loquacious, while the drake gabbles incessantly. The Baldpate is easily the tamest of the Anatinae.

10. **Nettion crecca.**—EUROPEAN TEAL.

At close range in good light the male can be separated without difficulty from our Green-winged Teal. While well acquainted with both birds in life, this species is so rare in North America that I would not regard a sight record as of any real scientific value.

11. **Nettion carolinense.**—GREEN-WINGED TEAL.

The male Green-winged Teal at close range is unmistakable because of its small size; chestnut colored head; white crescent in front of the wing, and absence of white in the wing. The female is more or less uniformly colored, a paler shade than the male Mallard, and no white in the wing.

In flight, at any distance, this species is easily determined by its very small size, 3–5 inches smaller than the Baldpate for instance. The flight is also exceedingly rapid, equalled by the Canvasback alone, and it is remarkable how the great speed is attained and maintained without apparent effort, while the Canvasback displays effort in its movements.

The male utters a short mellow whistle, somewhat like the first syllable of a Baldpate's note. The female quacks like a Black Duck but the notes are higher pitched, more often repeated and much less strident. Neither sex is particularly loquacious.

12. **Querquedula discors.**—BLUE-WINGED TEAL.

The male is easily recognized at close range by the crescentic patch of white in front of the eye, and both sexes by their small size and grayish blue wing-coverts, which at a distance seem to occupy about a third of the wing. This species is obviously a Teal by its small size, although it is a trifle larger than its relative.

At long distance in flight when color details are lost, the white crescentic patch of the male is invisible, and it then appears to all intents and purposes like the female. Under these circumstances it can be confused with the female Shoveller and the Green-winged Teal. The grayish-blue

wing coverts are conspicuous as a light area at a considerable distance, which serves to eliminate the uniformly brown Green-winged Teal. The Shoveller also has grayish-blue wing-coverts, but its bill is over 2¼ inches long, longer than any member of the family in this continent except the Swans, the bill of the Teal but little over an inch long.

The flight of this species is fully as rapid as its near relative. Both species drop suddenly into the water like Snipe, and frequently wheel about over the marsh in an erratic manner in a densely massed company like Sandpipers.

The male's note is a whistling "*peep,*" repeated five or six times. The female quacks less plainly and in a hoarser voice than the Green-wing. The notes are seldom heard.

13. **Spatula clypeata.**—SHOVELLER.

The Shoveller is still a very rare bird in the North-east, but is not uncommon in parts of the South and the Mississippi Valley.

The drake is an absolutely unmistakable bird, even at long range. In shape and size it looks like a Blue-winged Teal with a tremendously long bill, which gives the wings an effect of being way to the rear. The color pattern is unmistakable. Below there are 5 alternating areas of dark and light. The head looks black; from there to the front edge of the wing is an area of pure white, which appears like a broad ring around the body; the chestnut abdomen appears as a dark area, separated from the black under tail-coverts by a narrow band of pure white. At a great distance this narrow white band becomes invisible. If the upper-parts are seen, the back is dark, the white ring appears continuous, and the whole front half of the wing is pure white. The female has already been discussed.

Shovellers, while resembling Teal in shape and appearance, do not resemble them in speed of flight or other flight characteristics. In a large mixed flock of Anatinae the Shoveller will be at the top level of the flock, Teal will be at the bottom level towards the rear, and are the first to break away and dart back to the marsh. Teal will frequently not flush at all when surprised, but stretching the head and neck over the water will creep among the reeds along the bank and are astonishingly hard to detect. I have never known the Shoveller to attempt this. In fact, as a rule, most Anatinae will flush, even when invisible to the hunter in a canoe, and will rise to almost certain death above the shelter of the reeds.

14. **Dafila acuta.**—PINTAIL.

The male at close range is readily determined by the long tail feathers and a narrow line of white running up the sides of the neck between the bronzy brown of the sides of the head and the back of the neck. Both sexes at any distance can be determined by the length of their necks which are proportionately almost as long as in Geese. The female is more or less uniformly colored, about the same shade as a Mallard but without any white in the wing.

In flight this species can be distinguished at any distance by shape alone. The female is about as long as a Black Duck and the male considerably longer, though at any distance the long tail-feathers become invisible making it appear but little longer than the female. The long slender neck and slender body are, therefore, very striking. Compared with a Black Duck, the body is much narrower and less deep. The wings are also much narrower at the base than any other fresh water species. The flight resembles that of the Baldpate.

The female has a hoarse, guttural quack, the male a mellow, piping whistle like the syllables *whee, ee, ee, ee,* very rapidly uttered.

15. **Aix sponsa.**—WOOD DUCK.

The beautiful plumage of the male Wood Duck is unique, and unexcelled by any other North American species. On the wing the brilliancy of the colors is lost. The head is ornamented with a long crest, however, and there are conspicuous white markings on the sides of the head and neck, and a broad crescent of white in front of the wing. The female has a noticeable crest, is dark brown in general color, and resembles a female Baldpate in general appearance. The chin, is however, pure white, and there is a conspicuous white eye-ring. There is also very much less white in the wing.

In flight at any distance a stray female Wood Duck mixed in with other species could not be distinguished with certainty. It prefers wooded swamps and flooded lands, however, where the other species of Anatinae rarely occur. The Wood Duck is rarely seen in the marshes or on large bodies of water. It is perfectly at home in the woods, darting through the trees at top speed ,and frequently alighting on branches and stumps, a habit shared by no other species.

The commonest note of the male is a *hoo-éek-hoo-éek,* given when alarmed. It also, according to Eaton, has a mellow *peet, peet.* The call of the duck closely resembles her mate's.

American Museum of Natural History, New York.

(To be concluded)

THE WINTER BIRDS OF THE BILOXI, MISSISSIPPI, REGION.

BY JULIAN D. CORRINGTON.

HAVING occasion to spend the latter half of the winter of 1920–1921 on the Gulf Coast, I took the opportunity of making a study of the fauna, and particularly the birds of Biloxi, Mississippi, and its environs, and found this territory to be a veritible paradise for winter birds of all groups.

A second trip was made to Biloxi for the last nine days of December, 1921, and additional observations made at that time.

Concerning Biloxi. This region is a part of the American Riviera, which extends from New Orleans to Mobile, and which is fast becoming a popular "all-the-year-round" resort. The coast line is dotted with mansions and cottages and a line of watering places, the principal ones being from west to east, Bay St. Louis, Pass Christian, Gulfport, Biloxi, Ocean Springs, and Pascagoula. These cities are all in the State of Mississippi, and face the Mississippi Sound, a shallow body of water partially separated from the main Gulf by a chain of long and narrow islands, lying on an average of nine miles from shore. This country is served by the Louisville and Nashville Railroad, the Gulf and Ship Island Railroad, in part by an electric interurban line, and by fine shell roads.

Biloxi is situated on a long thin peninsula, washed by the Mississippi Sound on the south and the Biloxi Back Bay on the north. The chief industry is that of the sea,—fishing of all kinds, but principally the canning and exporting of oysters and shrimp. The immediate back country is not suitable for agriculture of a general nature, as nearly fifty per cent of the land is made up of small marshes and wooded swamps for a considerable distance inland. However, the orange and pecan groves flourish, and do well on reclaimed soil.

Acknowledgenments. The writer met with unfailing kindness and courtesy from many friends made in Biloxi, and wishes to especially recognize here the assistance rendered by Mr. John Hord, who made the more distant trips to Ship Island and the Pascagoula Swamp possible with his power boat and car, and who aided in many ways, among which was the satisfactory establishment of the presence of certain species not seen by the author. Thanks are also due Dr. A. A. Allen of the Zoological Department, of Cornell University, for helpful criticism of the manuscript.

Previous Publication. During the four day period of February 13–16, 1904, Messrs. H. H. Kopman, W. B. Allison, and Andrew Allison made observations in the vicinity of Bay St. Louis, the western-most of the Riviera resorts. This city is the county seat of Hancock County, and since this is the only one of the three coastal counties not covered in my own studies, I have decided to include

these records in the present writing. The younger generation of readers may not be familiar with Mr. Allison's paper, and then too, it is well to have the winter avifauna of the three adjacent counties incorporated in a single article. This report* includes 61 species, and is the only published record to my knowledge of this interesting region.

The territory embraced in the following records is by no means uniform in its faunal distribution, and for the purposes of this paper I have divided it into seven localities, designated by the letters A to G.

Locality A is bounded on the east and west by the cities of Biloxi and Gulfport, and on the north and south by Back Bay and Mississippi Sound respectively. Throughout it is heavily wooded with deciduous trees, with but scatterings of pines, which accounts for the absence or scarcity here of the typical birds of the great southern pineries. There are occasional small wooded swamps and innumerable small marshes, fresh water on the north, salt water on the south. A goodly number of farms and clearings occur, but field frequenting birds are rare. Several places in this area were especially good for bird study, notably the Biloxi Cemetery, the Confederate Soldiers' Home at Beauvoir, the Camp Ground, Heartsease, Handsboro, and the Golf Links. At Gulfport, a long pier runs out from the Great Southern Hotel grounds to the beach, crossing over a good sized salt marsh. This proved an especially fertile field for marsh birds, as one could look directly down upon them and observe with ease, though on descending to the ground he would be able to see little or nothing because of the dense and high growth. Much was accomplished here without the use of a blind.

Locality B includes the towns of Ocean Springs and Seymour, the latter being a cross-the-bay extension of Biloxi. The character of the land is quite different, and even in places where one might throw a stone across, the change from locality A to B is very noticeable. Deciduous woods are present but are greatly overshadowed by the pines, and large fields of various kinds occur,

* Allison, Andrew: Notes on the Winter Birds of Hancock County, Mississippi. Auk, XXIII, 1906, No. 1, pp. 44–47.

with apparently more successful and attractive farming. Marshes are much scarcer but there are several fair-sized swamps. As a consequence of these differences, the bird life of the two regions presents many contrasts. Meriting especial mention for field work are the vicinities of Seymour and Woolmarket.

Locality C, Deer Island, is a more compact unit as would be expected, and was one of the finest spots for bird study, particularly for groups lower than the Passeres, in the entire region. Pine groves clothe the eastern and western ends, and the shores everywhere teem with life. The bulk of the interior consists of one great marsh, well enough isolated from civilization to retain a primitive wildness, and was indeed a treasure house of marsh forms.

Locality D, Ship Island, is similar but not as good. Only the eastern tip, from the lagoon east bears any vegetation, and consists of pine groves and marshes. The remainder of the island is a long and narrow spit of bare sand.

Locality E is the Mississippi Sound portion of the region visited.

Locality F, the Biloxi Back Bay, is salt water for only a short distance inland, and was well supplied with bird life in spite of the constant traffic. The long bridge across to Seymour furnished good hunting with the field glasses.

Locality G embraces the great Pascagoula Swamp, a compact unit, and one well deserving of a separate volume. On two successive days my friend, Mr. Hord, took me out by automobile to points beyond Vancleave whence we paddled in a dugout through miles of veritable fairyland, covering different routes each time. An uncharted wilderness, this vast swamp consists of a maze of interlacing bayous and lakes in which the unacquainted would be speedily lost. The land areas, much of which were under water at the time of our visit, are heavily timbered but without the tangle of undergrowth one might expect, and the water everywhere was completely free from debris, never stagnant, and entirely fit to drink, In the bayous, all of which connect up with the large central Pascagoula River and its branches, the water averaged some fifty feet in depth and afforded wonderful fishing. We saw alligators and swarms of turtles, but very few snakes indeed. Mr. Hord told me that the razorbacks which run wild in the swamp keep them killed off. Hunting parties from Biloxi, Gulf-

port, and other points find the shooting exceptionally good here, the bags of Wild Turkeys running from ten to twenty for a two or three day trip of several persons, with a few deer and even an occasional bear. With limited time, we could not penetrate deeply enough into the swamp to find such game, but my ornithological zeal was satisfied by the sight of an Ivory-billed Woodpecker, a bird so near extinction that I had never hoped to see a living specimen.

Ecological Associations. Zoologically, the region lies in the Austroriparian Zone, and the characteristic species of this belt are well represented. In the following synopsis of the forms recorded it will be of value to note the ecological associations in which each typically occurs, together with those which it may invade. These environments are given as I found them to be for this particular region and for the winter only, and have no connection with the possible haunts of the birds at other places and seasons. No attempt was made in this study to work up the flora systematically, and of animals only the birds are given, as other forms lie without the scope of this publication. Thus simplified, I have listed the Associations under ten headings, as follows:

1. The Open Water Association, consisting here of localities E and F The flora includes the usual seaweeds of the shallows.

2. The Littoral Association, practically without vegetation and including all shore lines, tidal flats, bars, and the water bordering them for a distance of fifty feet outward.

3. The Marsh Association, involving fresh, brackish, and salt water marshes and made up principally of sedges, rushes, and cat-tails.

4. The Swamp Association, composed of small swamps in scattered places particularly in the various river bottoms, but reaching its full development only in the magnificent Pascagoula Swamp. Here the flora includes live oaks, cypress, sweet gum, tupelo gum, spruce-pine, and some scrub palmetto in the drier places.

5. The River Association. Fresh water streams in themselves form an environment characteristic of a few species and must be listed separately. Practically all of the other associations descend

to the very banks of the rivers, but the birds listed under this head are typical of the river and not of the surroundings. The Water-lily is the most frequent plant.

6. The Field Association. Under this general term are included such diverse habitats as wet meadows, dry upland fields, thickets, and the very numerous areas of scrub palmetto.

7. The Deciduous Woods Association. The characteristic tree all over this region is the live oak, which grows everywhere, from the beaches to the distant swamps. Many other oaks are in evidence, and there are lesser growths of magnolias, sycamores, hickories, etc.

8. The Coniferous Woods Association. Various evergreens are found, but the long-leafed yellow pine is the most abundant. This is a very compact association, many of the typical forms occurring nowhere else.

9. The Universal Association. An artificial group created to take care of some of the most widespread forms,—those which are encountered wherever one may go, be it beach, swamp, or dense pinery, and which are apparently equally at home in any environment.

10. The Social Association. Another artificial category, and including those species which are only to be met with in the immediate vicinity of dwellings, whether of town or farm.

Description of Field Studies. The record covers a period of 78 days, from January 13 to March 31, inclusive, during which time there were 26 days on which regular field trips were made for the express purpose of faunal study. Of these, 9 were taken in January, 10 in February, and 7 in March. Again, of the 26, 13 trips were made in Locality A, 8 in Locality B, 2 to C, 1 to D, and 2 to G. Localities E and F were studied in connection with many of the above trips, and were noted casually every day. In addition to the 26, cursory observations for a brief period to nearby points were made on 9 additional days.

On my second visit to Biloxi, covering the dates of December 23 to December 31, 1921, several cursory records were added, and two field trips made, one up the Biloxi River by boat, and one to the Pascagoula Swamp.

Hypothetical List. A number of species should be at least occasionally met with in this region in the winter that I did not find, and for whose presence I could not establish satisfactory evidence from local sources. Also it is well to call attention to the fact that certain groups are more fully represented in number of species in this region than the synopsis would indicate.

The Water Turkey (*Anhinga anhinga*) proved the most elusive of all. Many times I responded to calls to "come and see the Water Turkey," and many persons pointed a would-be specimen out to me, but in each case the bird in question turned out to be a Cormorant. I looked for them in all of the most suitable situations, especially inland on the rivers, but never found one.

Reports were both numerous and credible from fishermen, hunters, and from sailors stationed at the Gulfport Naval Training Station, of large mixed flocks of Ducks and Geese of many different species to be met with on the open Gulf beyond the chain of islands. Unable to go out there, I had to be contented with the small flocks and strays seen along the coast, and my list of Anseres is unquestionably very incomplete.

The Sandhill Crane (*Grus mexicana*) was another form of reported common occurrence but each bird observed proved, as might be expected, to be a Great Blue Heron.

The list of Rails is undoubtedly deficient, and both species of Gallinules should also occur in this fauna. The difficulties always attending the study of this group were intensified here by the dense and high growth in all the marshes, and by lack of time and opportunity to use a blind.

Shore-birds are certainly more numerous in species than my list would indicate, but are of erratic distribution locally as well as generally. More trips to the islands would probably have swelled my number of Limicolae considerably. I believe I saw some Semipalmated Sandpipers (*Ereunetes pusillus*) on Deer Island, but could not approach closely enough to make certain.

I expected to encounter the Ground Dove (*Chaemepelia passerina terrestris*) but could not find it or uncover any reliable records of its presence here. The same is true of the Osprey (*Pandion haliaëtus carolinensis*). A reward was offered anyone who could show me a Barn Owl (*Aluco pratincola*) but it remained unpaid.

No traces were found of Screech Owls, the Whip-poor-will, Purple Finch, Red-breasted Nuthatch, and others of anticipated winter occurrence.

Regarding the Pine Siskin (*Spinus pinus pinus*) there is some evidence but no proof. Allison's paper brackets this species with a question-sign and the remark: "Doubtful. A flock of supposed Siskins seen." Several persons in Biloxi also told me they are fairly sure of having seen Siskins during several winters.

Subspecies and Geographic Races. The ultimate analysis of certain forms was not determined, as I had no opportunity for general collecting or the preparation of skins, and the identification of the forms listed below cannot with certainty be made in the field. Also I question the value of going around shooting Meadowlarks, for example, just to see if the form present is the Meadowlark (*Sturnella magna magna*) or the Southern Meadowlark (*Sturnella magna argutula*) or if both occur. I did take one Grackle and found it to be the Florida Grackle (*Quiscalus quiscula aglaeus*) but the Bronzed Grackle (*Q. q. aeneus*) is very probably found here in the winter also.

The following forms are listed in the synopsis under the binomial term only, though it is practically certain that both the migratory and resident forms are intermingled all through this part of the South in the winter.

Migrant Race.	Resident Race.
Double-crested Cormorant	Florida Cormorant
Phalacrocorax auritus auritus	*Phalacrocorax auritus floridanus*
Great Blue Heron	Ward's Heron
Ardea herodias herodias	*Ardea herodias wardi*
Northern Flicker	Flicker
Colaptes auratus luteus	*Colaptes auratus auratus*
Meadowlark	Southern Meadowlark
Sturnella magna magna	*Sturnella magna argutula*
Migrant Shrike	Loggerhead Shrike
Lanius ludovicianus migrans	*Lanius ludovicianus ludovicianus*
Maryland Yellow-throat	Florida Yellow-throat
Geothlypis trichas trichas	*Geothlypis trichas ignota*
Robin	Southern Robin
Planesticus migratorius migratorius	*Planesticus migratorius achrusterus*

Synopsis of Species: The arrangement adopted for presenting the data of the synopsis is as follows:

First paragraph consists of statistical matter, made as concise as possible and arranged in the following order:

1. Status of species as a winter visitant or resident of this region.
2. Localities in which the species was found.
3. Typical ecological association in which the species occurs here in the winter, together with those which it may invade.
4. If the species is recorded in Allison's paper, the notation "Allison, common," "Allison, a few," etc., follows, giving the status as he found it in the Bay St. Louis district.

Remarks of a general or particular nature on phases of distribution, associations, notes, or unusual behavior are given in a second paragraph.

The nomenclature follows the A. O. U. Check-List of 1910 and subsequent supplement.

Of the 112 species listed, 96 were recorded by the present writer of which 54 were also noted by Allison, 7 additional forms were observed by Allison which I did not find, 4 more are mentioned in other papers by Allison, 2 rest on the reliable authority of Mr. Hord, and a final 3 were striking birds, impossible of confusion by the veriest amateur, and reported by numerous residents of Biloxi in such a manner that I am satisfied of the propriety of their inclusion in this list.

1. **Colymbus auritus.** HORNED GREBE.—Rare. Locality E. Littoral Association.

Throughout my first visit, none of these birds were seen, but on December 25, 1921, a very tame individual spent the day close to the shore at the Biloxi Yacht Club Pavilion, and was not frightened away by passing traffic.

2. **Podilymbus podiceps.** PIED-BILLED GREBE.—Common. Localities D, E, and F. Littoral Association, invades Open Water and River. Allison, 2.

Found in small flocks of three and four individuals, either quite tame and frequenting shore lines of busy waters, or farther out in company with Ducks.

3. **Gavia immer.** LOON.—Common. Locality E. Open Water Association, invades Littoral.

Occurred singly or in groups of from two to four. Were not unduly wary and did not mingle with other birds. Last seen April 4.

4. **Larus argentatus.** HERRING GULL.—Abundant. Localities E, and F along all shores. Littoral Association, invades Social along waterfront. Allison, common.

The majority of all specimens observed were immature birds. They could be seen at all times about the fishing docks and factories, but were much less in evidence along the residential beach. Last seen March 27.

5. **Larus delawarensis.** RING-BILLED GULL.—Abundant. Localities E and F along all shores. Littoral Association, invades Social on waterfront. Allison, common.

This was the most abundant Gull of any, and was more often met with along the residential than on the commercial beaches. Not observed after April 6.

6. **Larus atricilla.** LAUGHING GULL.—Allison states a few were seen by his party, but I did not record this species.

7. **Larus philadelphia.** BONAPARTE'S GULL.—Common. Localities E and F along all shores. Littoral Association, invades Social along waterfront.

This Gull was much less in evidence than others and like the Ring-billed, preferred the residential beach. All of the Gulls mingled considerably but while this species was often observed in company with the Ring-bills, it was seldom seen with Herring Gulls. Last recorded March 21.

8. **Sterna maxima.** ROYAL TERN.—Common. Localities E and F along the shores and bars. Littoral Association, invades Social on waterfront, but much less frequently than Gulls.

These birds were seen resting on sand-bars in company with Gulls, Skimmers and Limicolae, and were frequently noted singly while fishing. I did not identify any Caspian Terns, *Sterna caspia*, but judge that they too are found in this region as they winter on the Gulf Coast in many places. Allison records them on the Louisiana Coast not far distant,* but I do not give them a separate rating in this list, as I can find no definite data of their occurrence in this Biloxi region.

9. **Rynchops nigra.** BLACK SKIMMER.—Common. Locality E along shores of A and C. Littoral Association.

Skimmers were always seen in large flocks of from 75 to 100 individuals, and were most commonly found resting on the bars with Gulls, Terns, etc., and did not seem especially afraid. In fact, one flock approached a small skiff I was in with apparent curiosity, and as I made no movement, soon fell to feeding in their peculiar manner all about the boat, uttering their hound-like barkings. A certain flock roosted on the western spit of Deer Island and could be seen going out over the Gulf in the morning to points unknown, and returning about sundown. They flew swiftly, in very compact formation, and just barely above the surface of the water,

* Beyer, A. Allison, and Kopman. *List of the Birds of Louisiana, Part III*, Auk, Vol. XXIV, 1907, no. 3, p. 315.

keeping a perfect unison in the wing-beats. They did not feed en route during this daily journey.

10. **Phalacrocorax auritus.** DOUBLE-CRESTED CORMORANT.—Abundant. Localities E and F, near shores, and G. Littoral Association, invades Open Water, Swamp, and River.

One flock of 25 of these birds apparently roosted on or near the southern shore of Black Bay, as they were several times disturbed and seen to swim out from shore in the early morning. In a short while this flock would disperse and I never met such large groups after seven A. M. Cormorants were a common sight, though, at all times of the day perched singly on every buoy and beacon in the various harbors, and would suffer a close approach from passing boats. Individuals were also seen farther out in the Gulf, fishing from the surface of the water.

11. **Pelecanus erythrorhynchos.** WHITE PELICAN.—Uncommon. Open Water Association.

Not recorded by the writer. Reported to be occasionally met with in the open Gulf beyond the chain of islands, by fishermen, sportsmen, and others, who furnished accurate descriptions of appearance and feeding habits.

12. **Pelecanus occidentalis.** BROWN PELICAN.—Faily common. Locality E, near shores of A and D. Open Water Association, invades Littoral.

Seen fishing singly or by twos or threes. Occasionally noted perched in grotesque fashion on piles, once in company with Great Blue Herons. They fly with great ease and buoyancy for so heavy and clumsy looking birds, with more sailing than flapping, and when diving for fish do so precipitately and with a great splash that can be seen and heard half a mile or more.

13. **Fregata aquila.** MAN-O'-WAR BIRD.—Uncommon. Locality E, and beyond the chain of islands. Open Water Association.

I saw none of these unique birds myself, but they were reliably reported by fishermen and sportsmen.

14. **Mergus serrator.** RED-BREASTED MERGANSER.—Common. Localities E and F, near shores of A, C, and D. Open Water Association, invades Littoral.

Next to the Lesser Scaup this Duck was the tamest of any and suffered close approach by boat even during the shooting season. They were most commonly seen, in fact, where the bay traffic was the heaviest.

15. **Anas rubripes**(?). BLACK DUCK.—Uncommon. Locality E, near A. Open Water Association, invades Littoral.

I am not aware that this species has been recorded heretofore as wintering on the Gulf Coast, and so hesitate to make the diagnosis positive. Their winter range does include southern Louisiana, so that it seems quite likely that occasional specimens should be met within the territory covered by this paper. However, the Mottled Duck (*A. fulvigula maculosa*) could

also occur here with equal reason, and the two forms cannot with certainty be distinguished in the field, unless under exceptionally favorable circumstances. I am of the opinion that the flock of four birds I observed on March 18 were Black Ducks.

16. **Dafila acuta.** PINTAIL.—Common. Locality E, near D. Open Water Association, invades Littoral.

The largest flock I encountered numbered 24 individuals. They were feeding along sand-bar shallows and were very tame.

17. **Marila marila.** SCAUP DUCK.—Fairly common. Locality E, near A. Open Water Association, invades Littoral.

Seen only in very small flocks, and fairly tame.

18. **Marila affinis.** LESSER SCAUP DUCK.—Common. Localities E, near A, and also in D. Open Water Association, invades Littoral and Marsh.

Toward the end of the winter these Ducks became so confiding that they would swim along the very edge of the beach front within 25 feet of passing traffic. Present only in small flocks, but considerably more numerous than the preceding. Last seen April 4.

19. **Glaucionetta clangula americana.** GOLDEN-EYE.—Fairly common. Locality F. Open Water Association, invades Littoral.

Occurred in small flocks only and in company usually with Red-breasted Mergansers.

20. **Botaurus lentiginosus.** BITTERN.—Fairly common. Locality C. Marsh Association.

Apparently solitary at this season, but not infrequently heard booming and stake-driving.

21. **Ixobrychus exilis.** LEAST BITTERN.—Fairly common. Locality C. Marsh Association.

Both species of Bitterns were found only on Deer Island by the writer, but doubtless they occur elsewhere throughout the region in suitable locations.

22. **Ardea herodias.** GREAT BLUE HERON.—Abundant. Localities C, D, and G. Swamp Association, invades Littoral, Marsh, and River. Allison, 1.

These big Herons were especially frequent and picturesquely revealed along the shores of the islands, where they would wade out a considerabe distance from land and fish among the abundant schools of small fry. Their appearance in such a place is so Crane-like that one does not wonder at the reported observations of "Sandhill Cranes."

23. **Hydranassa tricolor ruficollis.** LOUISIANA HERON.—Satisfactorily identified and reported to be fairly common by several different parties in Biloxi. One was seen right on the front beach during my stay, but it was gone before I could answer the summons, and I saw none at any time.

24. **Florida cærulea.** LITTLE BLUE HERON.—Fairly common. Locality G. Swamp Association.

I found this species only in the Pascagoula Swamp, but no doubt it occurs elsewhere here in suitable places.

25. **Rallus elegans.** KING RAIL.—Probably not very common. Locality A. Marsh Association. Allison, common but inconspicuous.

Rails were certainly present in nearly every marsh throughout the area but as before stated, were especially difficult to observe and I hesitate to remark as to their specific abundance.

26. **Porzana carolina.** SORA.—Probably fairly common. Locality A. Marsh Association.

I saw only a few individuals of the two Rails here listed, and the Sora was of course more often met with than the King Rail.

27. **Fulica americana.** COOT.—Common. Localities A and C. Marsh Association.

Seen only on Deer Island, but their loud cackling notes were heard at Gulfport and elsewhere in Locality A.

28. **Philohela minor.** WOODCOCK.—Uncommon. Locality G. Swamp Association.

I only recorded a single specimen, seen on December 31, 1921, on my second trip, but Mr. Hord reports them as seen fairly often in a region of upland thickets near the borders of the Pascagoula Swamp, beyond Vancleave.

29. **Gallinago delicata.** WILSON'S SNIPE.—Abundant. Localities A, B, C, and D, most abundant in B. Marsh Association, (borders), invades Field and Deciduous Woods.

Snipe were by far the commonest of any game bird, and could be flushed by the dozens from the wet and soft borders of both fresh and salt-water marshes. They were nearly always gregarious but did not frequent the society of other birds. One solitary individual was observed along a brook in fairly deep deciduous woods.

30. **Oxyechus vociferus.** KILLDEER.—Abundant. Localities A, B, C, and D. Littoral Association. Allison, not uncommon.

The Killdeer allowed a fairly close approach and was usually seen in small flocks of from three to six, though one flock of 20 was noted. Also they were usually in company with Semipalmated Plovers and Gulls.

31. **Charadrius semipalmatus.** SEMIPALMATED PLOVER.—Common. Localities A and C. Littoral Association. Allison, a few,—the first winter record.

Observations on this little Plover ran all the way from a few solitary birds through medium sized flocks up to one of 200. They were always associated with Killdeers, and frequently with Gulls.

32. **Arenaria intrepres morinella.** RUDDY TURNSTONE.—Fairly common. Locality C. Littoral Association.

These were seen in small flocks in company always with the two preceding species.

33. **Colinus virginianus virginianus.** Bob-white.—Common. Localities A and B. Field Association.

Unlike most other species observed, Quail were not met with on the islands. The average size of a flock was five; the largest covey contained 30. At no time were they heard whistling.

34. **Meleagris gallopavo silvestris.** Wild Turkey.—Reported as common in the Pascagoula Swamp by Mr. Hord, Dr. H. H. West of Gulfport, and others. From 10 to 20 birds are commonly secured by small hunting parties in a sojourn of two or three days in the Swamp. I was unable to visit that portion of the Swamp in which the Turkeys are most numerous, and did not find any.

35. **Zenaidura macroura carolinensis.** Mourning Dove.—Abundant. Localities A, B, and C. Field Association. Allison, 1.

This bird was more often flushed from roadsides and plowed fields, usually in small flocks of two to four individuals.

36. **Cathartes aura septentrionalis.** Turkey Vulture.—Allison reports this species as common, with the remark that the two forms of Vultures do not mix much. Strangely enough, I saw not one single Turkey Vulture during my stay in Biloxi, and am at a loss to account for this apparent absence of so typical a bird. Stockard* states that the Black Vulture is much the commoner of the two in the southern part of the State.

* See Bibliography.

37. **Coragyps urubu.** Black Vulture.—Abundant. Localities A and B, most abundant in B. Field Association. Allison, common.

Vultures are said to shun the islands off Biloxi, and many were the local theories told me in explanation of this belief. I certainly saw none about the islands at any time, even Deer Island, which lies only a few hundred yards from the mainland, and this despite the fact that carcasses of both pigs and cattle were no uncommon sight on both Deer and Ship Island. This species prospects in groups, whereas the Turkey Vulture usually hunts alone. Only once did I see an individual Black Vulture soaring in solitude; the commonest number was three or four, and the largest flock noted contained 20.

38. **Circus hudsonius.** Marsh Hawk.—Fairly common. Localities C and D. Marsh Association.

As if in contrast to the preceding species, I met with Marsh Hawks only on the islands, but presumably they were present elsewhere in marshes of a size large enough to secure some degree of isolation.

39. **Accipiter velox.** Sharp-shinned Hawk.—Common. Localities A and B. Universal Association.

I met these little fellows in most unexpected places,—one right in the city of Gulfport,—and found them bold and aggressive and always solitary.

40. **Buteo borealis.** RED-TAILED HAWK.—Under this head Allison remarks, "A large Hawk seen at a distance must have been of this species." Though I saw three other forms of large Hawks, I met with none of this species, and would not include it on such slender evidence were it not for the fact that the Red-tail's winter range extends to the Gulf Coast in general, and such a wide ranging Hawk would certainly be found here occasionally.

41. **Buteo lineatus.** RED-SHOULDERED HAWK.—Common. Localities A and G. Swamp Association, invades Deciduous Woods.

These noisy Hawks were always seen in pairs, which fact suggests the probability that they were the resident form, the Florida Red-shouldered Hawk (*Buteo lineatus alleni*). The type race, *B. l. lineatus*, winters south to the Gulf Coast, but should not be paired at this season, as the spring migrants come north unmated.

42. **Buteo platypterus.** BROAD-WINGED HAWK.—Fairly common. Locality A. Deciduous Woods Association.

Observed to be far less wary than other Hawks, a trait for which the species is noted. One memorandum on this bird is especially unusual and interesting. Two Broad-wings were seen on April 2 in company with a Sharp-shinned Hawk, the three being flushed at close quarters from adjacent parts of the same dead tree. I was walking with a companion down a road through deciduous woods, and in plain sight we stopped to watch the Hawks. They rose above us to the level of the tree tops and began to circle and wheel about at this altitude, paying us no attention and showing no fear whatever. They seemed to be at play and reminded me of schoolboys at a game of tag. Flapping and sailing about in small circles, diving down toward or even into the tree tops and at each other, they presented a curious spectacle. The Sharp-shin seemed to have as much of a part in the sport as any, and far from objecting to the intrusion of a totally different type and species, the Broad-wings appeared to make him welcome. All three maintained silence during the whole performance, which lasted some ten minutes. Gradually the centers of the revolutions shifted, and the three Hawks drifted away over the trees and disappeared. I am certain that the Broad-wings, which at this time of the year were probably a mated pair, were not trying to drive the Sharp-shin away from a possible nesting-site or out of their sphere of the woods.

43. **Haliaeetus leucocephalus leucocephalus.** BALD EAGLE.—Uncommon. Locality B. Littoral Association, invades River and Coniferous Woods.

I saw one specimen perched in a pine tree that was particularly tame. He did not take wing until I approached to within fifty feet and then flew but a short distance, again alighting in a pine. This action was repeated three times, when finally in seeming disgust, the Eagle flew high into the air and headed for the Gulf, uttering his loud cries.

44. Falco sparverius sparverius. SPARROW HAWK.—Abundant. Localities A, B, C, and D. Field Association. Allison, not common.

These birds were always seen singly, perched on some dead stub that commands a large field.

45. Strix varia alleni. FLORIDA BARRED OWL.—Fairly common. Locality G. Swamp Association. Allison, 1.

I heard a number of these noisy Owls in the Pascagoula Swamp, but did not see any.

46. Bubo virginianus virginianus. GREAT HORNED OWL.—Mr. Hord reports these birds to be common in the Pascagoula Swamp, but I saw none myself.

47. Ceryle alcyon alcyon. BELTED KINGFISHER.—Common. Localities A, B, C, D, and G. River Association, invades Littoral-Marsh, and Swamp.

While commonly seen fishing in pairs during the breeding season, I found them to be strictly solitary here in the winter.

48. Campephilus principalis. IVORY-BILLED WOODPECKER.—Uncommon. Locality G. Swamp Association.

After hearing of the great wildness of the Pascagoula Swamp, I had hoped to find these nearly extinct birds still holding out there, and was assured that a visit to the big Swamp would be rewarded by several views of this magnificent Woodpecker. Circumstances made it impossible for me to spend the night there, and it was necessary to start from Biloxi in the morning and return the same evening. This called for a jaunt of 80 miles by auto, and limited the time at the Swamp to such an extent that we could not penetrate to those remote and little visited portions to the north and east where the Ivory-bill as well as all the wilder and rarer game exist in greatest numbers. Nevertheless I did see one specimen on the first visit to the Swamp, though I saw none the second trip. Both Mr. Hord and I had a splendid and satisfactory view of the bird, a large male in fine plumage. The species has been observed frequently enough by Mr. Hord, Dr. H. H. West of Gulfport, Dr. G. F. Carroll of Biloxi and others while on hunting and fishing trips so as to be listed as uncommon rather than rare.

The third trip to the Swamp, made on December 31, 1921, during the second visit to Biloxi, was uneventful as regards Ivory-bills until we were nearly ready to leave, when a large woodpecker flew across a vista some distance in front of us. An instant later the call of presumably this same bird was heard, and while I have had no previous experience in the call of the Ivory-bill, this call was a loud, rather nasal, *yap, yap-yap*, sounding in the distance like a penny trumpet. (Chapman: *Camps and Cruises*.) Even as to the bird must have been either an Ivory-bill or Pileated Woodpecker, and the call heard was certainly not that of the latter.

49. Dryobates villosus audubonii. SOUTHERN HAIRY WOODPECKER.—Common. Localities A and B. Deciduous Woods Association. Allison, a few.

This form is relatively more abundant than is in *D. v. villosus* in the north. It was always solitary and unassociated.

50. **Dryobates pubescens pubescens.** SOUTHERN DOWNY WOODPECKER.—Abundant. Localities A and B. Deciduous Woods Association. Allison, uncommon.

Occurred in about the same proportion as does the northern form, *D. p. medianus*, but single and unassociated, since the factor of limited food supply which operates to bring together the Downy, Chickadee, and White-breasted Nuthatch in a northern winter is not present here.

51. **Dryobates borealis.** RED-COCKADED WOODPECKER.—Fairly common. Locality B. Coniferous Woods Association. Allison, common.

Usually seen in pairs and sometimes associated with Red-bellied Woodpeckers, Flickers, Brown-headed Nuthatches, Pine Warblers, and Bluebirds.

52. **Sphyrapicus varius varius.** YELLOW-BELLIED SAPSUCKER.—Fairly common. Localities A, B, and C. Deciduous Woods Association.

Always single, but associated with some other species of Woodpecker. Not recorded after February 25.

53. **Phlœotomus pileatus pileatus.** PILEATED WOODPECKER.—Fairly common. Localities B and G. Swamp Association, invades Deciduous Woods.

I found this big fellow only in the Pascagoula Swamp, but Miss Josie Pope of Biloxi, has seen it at Woolmarket also. The local vernacular names applied indiscriminately to this species and the Ivory-bill are interesting. The commonest term is "Lord God," said by some to be in fancied imitation of one of the call notes, but I agree with the explanation of Miss Pope that it is a corruption of "Log Cock," a designation met with in many parts of the south. The "Lord God" has in turn suffered corruptions, among them being "Good God" and "Oh My God." These deified or perhaps anathematized birds are unfortunately too often the target of the thoughtless hunter's gun in the big Swamp, and will go the way of the Ivory-bill unless better protected. In spite of such persecution I found them by no means shy.

54. **Melanerpes erythrocephalus.**—RED HEADED WOODPECKER. Abundant. Localities A, B, and G. Swamp Association, invades Deciduous Woods and Social. Allison, a few.

These Woodpeckers were so abundant in the Pascagoula and other smaller swamps that I considered the species as typically a swamp bird here at this season. Quarrelsome as ever, they were never seen actually paired or in groups, and their silence seemed strangely unnatural.

55. **Centurus carolinus.** RED-BELLIED WOODPECKER.—Abundant. Localities A, B, C, and G. Deciduous Woods Association, invades Swamp and Coniferous Woods. Allison, a few.

Unlike the preceding, this bird was never found on the streets of Biloxi or near the beaches, and was never single but always paired and noisy.

36. **Colaptes auratus.** Flicker.—Abundant. Localities A, B, and G. Deciduous Woods Association, invades Swamp, Field, and Coniferous Woods. Allison, common, mostly in small flocks.

In contrast with Allison's observations, I did not find Flickers in small flocks but usually singly, though almost always in company with some other Woodpecker, or Pine Warblers, Bluebirds, etc. I did not see any specimens feeding on the ground here, though ants were abundant.

37. **Sayornis phoebe.** Phoebe.—Common. Localities A and B. River Association, invades Littoral, Swamp, and Field. Allison, common.

In song all winter and solitary. Last seen February 25.

38. **Cyanocitta cristata cristata.** Blue Jay.—Abundant. Localities A, B, C, D, and G. Universal Association. Allison, common.

Present at all times and in all places, usually in flocks of from three to six members and always in the company of other birds. The Jays seemed to want society or to be interested in the affairs of other birds, though the particular species of associate made no difference.

39. **Corvus brachyrhynchos brachyrhynchos.** Crow.—Fairly common. Localities A and B. Deciduous Woods Association, invades Swamp and Field. Allison, very common.

Crows were very much less abundant than was expected, or as Allison found them, or as they are in the north in winter. They were not present on the islands or coasts, and did not mingle with the Fish Crows.

40. **Corvus ossifragus.** Fish Crow.—Abundant. Localities A, B, C, and G. Littoral Association, invades Swamp, Marsh, and Field. Allison, common.

These birds greatly outnumbered the common Crow and were as typical of shore areas as Gulls, in less frequented places. Though numerous on Deer Island, near the mainland, they were absent on Ship Island, twelve miles out. The call note is usually described as a nasal *car*, and I have never seen a two-syllabled note mentioned in the literature of the species, but I found that the commonest call uttered consisted of distinctly two syllables, a hoarse *car-uh*.

41. **Molothrus ater ater.** Cowbird.—Rare. Locality A. Field Association.

Only one specimen was seen, a male in song, on January 21.

42. **Agelaius phoeniceus floridanus.** Florida Red-wing.—Abundant. Localities A, B, C, D, and G. Marsh Association, invades Field. Allison, rather common.

Present in large flocks and in song all winter. In the marshes they associated with Rusty Blackbirds and Florida Grackles, and in orchards with Meadowlarks.

43. **Sturnella magna.** Meadowlark.—Abundant. Localities A and B. Field Association.

Meadowlarks were met with but rarely in Locality A, and then with but few exceptions on the Golf Links. In B they were very abundant, and in song all winter.

64. **Euphagus carolinus.** RUSTY BLACKBIRD.—Abundant. Localities B, C, and D. Marsh Association, invades Deciduous Woods. Allison, one flock in a pine clearing.

Found in numbers only in the marshes of the islands, and there mingling with Red-wings and Grackles, and usually singing.

65. **Quiscalus quiscula aglæus.** FLORIDA GRACKLE.—Common. Localities A, B, C, and G. Marsh Association, invades Social. Allison, a few.

These birds were uncommon except on Deer Island until the very end of March, when they invaded the towns in force. Always gregarious and noisy when present.

66. **Megaquiscalus major major.** BOAT-TAILED GRACKLE.—Uncommon. Locality D. Marsh Association. Allison, fairly common.

The few specimens I saw on Ship Island were feeding on marshy flats and were silent.

67. **Passer domesticus domesticus.** HOUSE SPARROW.—Occurred all too abundantly in all localities of the Social Association.

68. **Astragalinus tristis tristis.** GOLDFINCH.—Common. Localities A and B. Deciduous Woods Association, invades Field and Social. Allison, rather common.

Small flocks were frequent in the less noisy streets of the towns. Singing though not in full song. Last recorded March 25.

69. **Poœcetes gramineus gramineus.** VESPER SPARROW.—Fairly common. Localities A and B. Field Association. Allison, rather common.

Allison states that he found them in song, but all the birds I observed were silent. The typically associated species of the cultivated fields and orchards, found on the ground in mixed flocks, consisted of Vesper, Savannah, Grasshopper (occasionally), Chipping and Field Sparrows, and often Yellow Palm Warblers and Bluebirds.

70. **Passerculus sandwichensis savanna.** SAVANNAH SPARROW.—Fairly common. Localities A and B. Field Association. Allison, sparingly present.

Not in song and never solitary.

71. **Ammodramus savannarum australis.** GRASSHOPPER SPARROW.—Uncommon. Localities A and B. Field Association.

Not in song, and usually single, though always associated with other Sparrows.

72. **Passerherbulus nelsoni nelsoni.** NELSON'S SPARROW.—Mentioned by Allison as not common but represented in the marshes of the coast in a paper on the Sparrows of Mississippi.* The designation as *Ammodramus caudacutus* must refer to this form, the only one of the

* Allison, Andrew: The Sparrows of Mississippi. Auk, XVI, 1899, no. 3, pp. 266-270. This citation, p. 268.

Sharp-tailed Sparrows to reach the Gulf Coast in winter. I did not myself observe this bird.

73. **Passerherbulus maritimus.** SEASIDE SPARROW.—Noted in this same paper as very abundant. Of the five races of this species recognized by the A. O. U., the Louisiana Seaside Sparrow (*P. m. fisheri*) and the Macgillivray's Seaside Sparrow (*P. m. macgillivrayi*) are the two forms whose winter range includes the Gulf Coast. Allison's description was *Ammodramus maritimus*. Not noted by the present writer.

74. **Chondestes grammacus grammacus.** LARK SPARROW.—Reverting to 'Allison's Winter' Birds paper, this species is recorded with the following note: "We found this species in the pine clearings, about equally common with the Vesper Sparrow, and in song. Up to this time we had found it only very rarely." I saw none myself.

75. **Zonotrichia albicollis.** WHITE-THROATED SPARROW.—Abundant. Localities A, B, C, and G. Field Association, invades Deciduous Woods. Allison, common.

White-throats were abundant in thickets, associated with Towhees, till the first of March, after which they became rare. Not in song.

76. **Spizella passerina passerina.** CHIPPING SPARROW.—Abundant. Localities A and B. Field Association, Allison, very common.

I found Chippies in frequent small or medium-sized flocks, mingling with other Sparrows, and occasionally in very large bodies, alone. I never met with them in any of the towns, as did Allison, an environment which they are commonly supposed to prefer in the south in winter. Not in song, and it was a curious sight to come across a hundred of these birds feeding briskly over some large recently burned tract, the whole flock shifting ahead as fast as a man walks, each bird moving separately, and all as silent as though they had completely forgotten their familiar little chant.

77. **Spizella pusilla pusilla.** FIELD SPARROW.—Abundant. Localities A and B. Field Association.

Present in all mixed Sparrow flocks, and not in song.

78. **Junco hyemalis hyemalis.** SLATE-COLORED JUNCO.—Allison's paper on the Sparrows, recently cited, says of the Junco: "Winters abundantly in northern Mississippi but apparently only reaches the Coast in very severe winters." My winter there was a very mild one, and I did not see these cheery little sprites.

79. **Melospiza melodia melodia.** SONG SPARROW.—Uncommon. Localities A, B, and C. Field Association, invades Littoral and Marsh.

Only about a dozen were seen all winter, and they kept to themselves and were not singing. Last recorded on February 22.

80. **Melospiza georgiana.** SWAMP SPARROW.—Fairly common. Localities A and B. Marsh Association. Allison, common.

These Sparrows did not associate with other birds. They were not observed in the extensive marshes of the islands, and were not in song.

81. **Pipilo erythrophthalmus erythrophthalmus.** TOWHEE.—Abundant. Localities A and B. Deciduous Woods Association. Allison, a few.

The call notes of Towhees were characteristic of all thickets on the mainland, and occasional birds were in full song all winter.

82. **Cardinalis cardinalis cardinalis.** CARDINAL.—Abundant. Localities A, B, and G. Deciduous Woods Association, invades Swamp, River, and Field. Allison, rare.

Allison writes: "Rare! This is hardly normal, though it is never as common here as is *C. c. magnirostris* in lower Louisiana." I found Cardinals present in numbers in all suitable situations on the mainland. They began singing the middle of February.

83. **Progne subis subis.** PURPLE MARTIN.—Rare. Localities A and B. Social Association, invades Field. Allison, a few.

The description of the status as rare applies to the Martin only as a winter resident. Allison brackets his inclusion of this species, and remarks: "A spring bird, of course, and so hardly in keeping in this list; a few were present, being seen and heard nearly every day of the trip" (Feb. 13–16). My records show that Martins were first observed on February 18, becoming common by the first week of March, and abundant by the 15th. Strictly speaking, they are probably not to be considered as a winter resident, but as the earliest of spring migrants. Their presence during so considerable a portion of the winter, however, justifies their inclusion in this list. From the first, they established head-quarters in the Martin boxes, which were to be found in nearly every back yard.

84. **Iridoprocne bicolor.** TREE SWALLOW.—Abundant. Localities A, B, C, and G. Universal Association.

The only true winter resident Swallow, these birds were to be seen at all times and in all places. They did not seem to prefer marshes and were as commonly met with over the Gulf and in the towns. Abundant till the middle of February, there was a very noticeable reduction in their numbers till the first of April, when large flocks were again in evidence. It is likely that the earlier multitudes were the real winter residents, which started north first, and the later Swallows those which were coming up from sojourns farther south.

85. **Bombycilla cedrorum.** CEDAR WAXWING.—Abundant. Localities A and B. Deciduous Woods Association. Allison, only a few heard.

The outstanding feature in the winter distribution of Waxwings here, and which I have not seen brought out in other writings, was their constant and close association with Robins. At no time were they noted separately, or in small numbers. Early mornings were the best times at which to observe the great flocks of these two species, Robins predominating, as they flew far overhead, presumably leaving the roost for the feeding grounds. The largest single flock I estimated to contain 500 Robins and 200 Waxwings, but many others of nearly equal size were seen. Robins

continued abundant till early in March, but Waxwings disappeared after February 12.

86. **Lanius ludovicianus.** LOGGERHEAD SHRIKE.—Abundant. Localities A and B. Field Association, invades Littoral. Allison, common. Usually met with singly, occasionally in pairs, and not singing.

87. **Vermivora celata celata.** ORANGE-CROWNED WARBLER—I did not record this species at all, but Allison writes of them. "Conspicuous when present, and not at all uncommon in the deciduous woods, though always single."

88. **Dendroica coronata.** MYRTLE WARBLER.—Abundant. Localities A, B, C, D, and G. Universal Association. Allison, very common and ubiquitous.

Takes first rank in abundance over all other birds. Large scattered flocks were present everywhere, on the sandy beaches, in marshes, swamps, fields, islands, all woods, and the towns. They frequently fed on the ground in company with various field-dwelling Sparrows, and were not singing. I roughly estimated the number of individuals present per county throughout this region as 15,000.

89. **Dendroica vigorsi.** PINE WARBLER.—Abundant. Localities A, B, C, and D. Coniferous Woods Association. Allison, very common. In song all winter, and met with in every pinery. Usually associated with other Warblers and Bluebirds.

90. **Dendroica palmarum hypochrysea.** YELLOW PALM WARBLER. —Common. Localities A and B. Field Association, invades Deciduous and Coniferous Woods. Allison, common.

Allison found them always more or less gregarious and associated with Pine Warblers. My notes partially confirm this, but I also often found them singly, feeding in the fields or on the Golf Links with various Sparrows. Not in song.

91. **Geothlypis trichas.** MARYLAND YELLOW-THROAT.—Uncommon. Localities A and B. Field Association. Allison, 2 heard.

Singing all winter, and frequenting low and rather dense situations. The least common of any Warbler present.

92. **Anthus rubescens.** PIPIT.—Abundant. Localities A, B, and C. Field Association, invades Littoral. Allison, not common.

When met with on the beaches these birds were in small groups of three to five, but on inland fields, particularly recently burned-over areas, large flocks were the rule, the largest seen numbering 100. Not singing, but their flight notes were always given when flushed.

93. **Anthus spragueï.** SPRAGUE'S PIPIT.—While not included in Allison's list from which I have been quoting, and not observed by myself either, a separate note by Allison reads as follows: "On January 1, 1902, a specimen of Sprague's Pipit was taken by W. B. Allison and the writer, in a low meadow cleared from the pine woods near Bay St. Louis.

It was in fine plumage and good condition. Another was seen in the same place on February 11, 1903. These two are the only Mississippi records."*

94. **Mimus polyglottos polyglottos.** MOCKINGBIRD.—Abundant. Localities A, B, C, D, and G. Universal Association. Allison, common.

Found singly, more frequently paired, and fairly often in groups of three to five. Present in all situations and with various associates, mainly Jays, Towhees, and Myrtle Warblers. They began singing the middle of February, but were not heard at night till the end of March.

95. **Dumetella carolinensis.** CATBIRD.—Rare. Localities A and G. Deciduous Woods Association, invades Swamp.

Only two were recorded. These were single, unassociated, and not in song.

96. **Toxostoma rufum.** BROWN THRASHER.—Common. Localities A, B, and G. Field Association, invades Swamp and Deciduous Woods. Allison, 2.

Met with singly and in pairs, mingling with Towhees, Cardinals or Mockingbirds, and not singing.

97. **Thryothorus ludovicianus ludovicianus.** CAROLINA WREN.—Abundant. Localities A, B, C, D, and G. Deciduous Woods Association, invades Coniferous Woods and Social. Allison, very common.

In fine song all winter, these Wrens were perhaps the most thoroughly typical bird of the region. Observed singly and paired, but unassociated. Their voice was the first to begin the morning bird chorus, commencing about five minutes before the Mockingbird.

98. **Thryomanes bewicki bewicki.** BEWICK'S WREN.—Rare. Locality A. Social Association. Allison, 2.

I saw only a single specimen, occupied in investigating the bare lattice-work of an arbor, and not in song.

99. **Troglodytes aëdon aëdon.** HOUSE WREN.—Common. Localities A, B, and C. Deciduous Woods Association, invades Field and Social. Allison, not common.

Occurred singly or in pairs in the woods, thickets, and scrub palmettos, and less often about buildings. Unassociated and not in song.

100. **Cistothorus stellaris.** SHORT-BILLED MARSH WREN.—Allison notes this species as not uncommon, but I did not record it.

101. **Telmatodytes palustris iliacus.** PRAIRIE MARSH WREN.—Uncommon. Locality A. Marsh Association.

I met with this variety of the Long-billed Marsh Wren only occasionally. They then formed a part of the typical marsh fauna and were singing.

102. **Certhia familiaris americana.** BROWN CREEPER.—Rare. Locality A. Deciduous Woods Association.

Only one was seen,—on the 17th of January.

* Allison, Andrew: Notes from Hancock County, Mississippi. Auk, XXIII, 1906, no. 2, p. 232.

103. **Sitta carolinensis.** WHITE-BREASTED NUTHATCH.—Allison mentions this species as follows: "Very conspicuous; we saw it in company with Bluebirds and Pine and Yellow Palm Warblers, even feeding with them on the ground, in one instance." In view of such observations it is most remarkable that I neither saw nor heard a single one, and cannot account for the absence of so typical or common a bird. And I am convinced that they were absent, because it is inconceivable that so ubiquitous a form could continually escape recording if present. The variety Allison noted was probably no. 727b., the Florida White-breasted Nuthatch, *S. c. atkinsi*, as the range of the typical form, *S. c. carolinensis*, does not include the Gulf Coast.

104. **Sitta pusilla.** BROWN-HEADED NUTHATCH.—Common. Localities A, B, C, and G. Coniferous Woods Association. Allison, abundant.

The commonest notes of this species impressed me as bearing a strange resemblance to those of the Red-shouldered Hawk,—a *kee-you, kee-you,* —uttered in the cheery timbre of the Goldfinch, and of course lacking the volume and ferocity of the Red-shoulder's cry. These little Nuthatches were always seen in small bands of from two to eight individuals, very talkative, and frequently associated with other characteristic birds of the pines.

105. **Baeolophus bicolor.** TUFTED TITMOUSE.—Common. Localities A, B, and G. Deciduous Woods Association, invades Coniferous Woods. Allison, very common.

Titmice were always gregarious, singing, and in company with Chickadees.

106. **Penthestes carolinensis carolinensis.** CAROLINA CHICKADEE. —Common. Localities A, B, and G. Deciduous Woods Association, invades Coniferous Woods. Allison, common.

Found singly, but more often in groups up to five, and travelling with Titmice, but not with the Downy Woodpecker or Nuthatches as does the Black-cap in northern winters. Also they were not nearly as talkative as their northern cousins.

107. **Regulus satrapa satrapa.** GOLDEN-CROWNED KINGLET.— Fairly common. Localities A and B. Coniferous Woods Association. Allison, common.

Found in small bands, and not singing. Last seen February 22.

108. **Regulus calendula calendula.** RUBY-CROWNED KINGLET.— Common. Localities A and B. Deciduous Woods Association, invades Coniferous Woods. Allison, fairly common.

Allison found this species less common than the preceding, whereas I made the reverse observation, the difference being probably due to the greater abundance of pineries in the Bay St. Louis region. This Kinglet occurred singly and in pairs or small groups of three or four, associated with White-throated Sparrows, Towhees, and Myrtle Warblers, and was not singing.

109. **Polioptila cærulea cærulea.** BLUE-GRAY GNATCATCHER.—Rare. Locality A. Deciduous Woods Association.

These miniature Mockingbirds became fairly common by the end of March, but were rare as a winter resident. Solitary and silent when present. On December 27, on the second trip, however, two were seen together, and were mewing.

110. **Hylocichla guttata pallasi.** HERMIT THRUSH.—Common. Localities A and B. Deciduous Woods Association. Allison, common.

Met with in low wet areas of fairly dense growth and always voiceless and alone.

111. **Planesticus migratorius.** ROBIN.—Abundant. Localities A, B, and C. Deciduous Woods Association, invades Coniferous Woods. Allison, abundant.

Of the Robin, Allison has this interesting note: "Over great tracts of young pine, cleared land, and burnt forest, we often walked, seeing hardly any birds but these; they flushed before us at almost every step, and soon became an important feature of the landscape." I seldom met with Robins in such situations, or on the ground, though occasionally I would find flocks perched in the woods. As mentioned under the Cedar Waxwing, very large companies of from one to five hundred individuals were a common sight flying far overhead in the early morning. The Robin here is by no means a bird of the lawns and gardens as in the north in summer, but is as wild as the wildest and frequents only remote districts for feeding and roosting. Perhaps the fact that Robin-pie is still considered a delicacy by negroes and "poor whites" is partly responsible for this condition. Not in song.

112. **Sialia sialis sialis.** BLUEBIRD.—Abundant. Localities A and B. Field Association, invades Deciduous and Coniferous Woods, and Social. Allison, very common.

Bluebirds were quite gregarious, and singing all winter. Their most frequent associates were Myrtle, Pine, and Yellow Palm Warblers in the woods, and various Sparrows and the Yellow Palm Warblers again in the fields. One of their commonest feeding habits was like that of the Pine Warbler, clinging with much fluttering to the sides of trees, and the favorite perch in the woods was a short dead stub on any tree, as low down as possible.

Bibliography: Throughout the synopsis, Allison's paper on the 'Winter Birds of Hancock County' has been quoted, and scattered notes were found relative to some particular species as occurring on the Mississippi Coast in winter, with occasional references to summer birds. This comprises the literature of the region, but a bibliography of the Ornithology of Mississippi is here given for the future convenience of those interested in this badly neglected State. The complete files of 'The Auk,' 'Bird-Lore,' and 'Wilson Bulletin' were carefully combed, and all papers found and here

appended were consulted in the preparation of this report, and I feel that the list is fairly complete. Most of the articles are very short, many consisting of but fragmentary notes, and there is a great deal of room and need for further work in this section of the country. Those worth consulting for general purposes are marked with a star.*

Allison, Andrew: The Sparrows of Mississippi.* Auk, XVI, 1899, no. 3, pp. 266–270. 16 species.

Louisiana and Mississippi Bird Notes. Auk, XVII, 1900, no. 3, p. 297. Migration notes on 5 miscellaneous species.

Notes on the Winter Birds of Hancock County, Mississippi.* Auk, XXIII, 1906, no. 1, pp. 44–47. 61 species.

Notes from Hancock County, Mississippi. The same, no. 2, p. 232. For record of Sprague's Pipit.

Notes on the Spring Birds of Tishomingo County, Mississippi.* (Northeast corner of State), Auk, XXIV, 1907, no. 1, pp. 12–25. 115 species.

Audubon Club Work, State Reports; Mississippi; Bird Lore; VII, 1905, pp. 95–96. VIII, 1906, p. 230. XI, 1909, p. 318. XVIII, 1916, p. 214 (unofficial note).

Bird Lore Christmas Censuses: Eighth; X, 1908, p. 34, Deemer, Miss., Mrs. F. E. Watrous, 44 species, 753 individuals.

Tenth; XII, 1910, p. 30, Woodville, Miss., H. G. McGowan, 31 species, 240 individuals.

Thirteenth; XV, 1913, Oak Vale, Miss., D. D. Fostersberry, 16 species, 117 individuals.

Cooke, W. W., Notes on the Occurrence of Certain Birds in the Mississippi Valley. Auk, II, 1885, no. 1, pp. 31–33. Presence of Hawk Owl at Corinth (N. E.) Miss.

Hay, O. P., A List of Birds from the Lower Mississippi Valley, observed during the Summer of 1881, with brief notes. Bull. Nuttal Ornith. Club, VII, 1882, pp. 89–94. 61 species, Vicksburg and Jackson, Miss., district.

Kopman, H. H., Louisiana Migration Notes. Auk, XX, 1903, no. 3, pp. 309–310. Mentions data of four species of Warblers at Bay St. Louis, Miss.

Bird Migration Phenomena in the Extreme Lower Mississippi Valley. Auk, XXI, 1904, no. 1, pp. 45–50.

Warbler Migration in Southern Louisiana and Southern Mississippi. Auk, XXII, 1905, no. 3, pp. 289–296. 13 species.

Aspects of Bird Distribution in Louisiana and Mississippi. Auk, XXIV, 1907, no. 2, pp. 169–181. Discusses migration and local distribution of birds in S. E. La. and Miss. Coast.

Nesbitt, N. B., Woodcock Nesting in Northern Mississippi. American Field, XXI, March 29, 1884, p. 305.

STOCKARD, C. R., Nesting Habits of the Woodpeckers and the Vultures of Mississippi. Auk, XXI, 1904, no. 4, pp. 463–471.

Nesting Habits of Birds in Mississippi.* Auk, XXII, 1905, no. 2, pp. 146–158; no. 3, pp. 273–285. 83 species.

WOOD, C. H., Habits of Southern Cranes. American Field, XXVI, 1886, no. 8, Aug. 21, p. 175. On the breeding of Herons at Moss Point, Miss.

Zoological Department, Cornell University, Ithaca, N. Y.

NOTES ON THE ABUNDANCE AND HABITS OF THE BALD EAGLE IN BRITISH COLUMBIA.

BY ALLAN BROOKS.

THE following notes are the result of observations covering a period of about twenty-seven years (between 1887 and 1920), in the Province of British Columbia. The special features they are meant to cover in regard to the Bald Eagle (*Haliaeetus leucocephalus alascanus*) are: (1) Its present and former numerical strength in the Province; (2) The destructiveness of the species to game and waterfowl.

I have found the Bald Eagle to be generally distributed in British Columbia but always in the vicinity of water, and it is far more abundant on the coast west of the Cascade Mountains than in the interior.

All over the region east of the coast and Cascade ranges this Eagle is found in too small numbers to be of much economic importance. The food supply in the interior is uncertain and so regulates their numbers, also the nesting places are more exposed and accessible than on the coast, which tends to keep their numbers down.

On the coast, and up the larger rivers that break through the coast and Cascade ranges, the Bald Eagle finds a generous food supply and open winters which permit of its existence in larger numbers than on any other portion of the continent. My first acquaintance with the species was in the lower Fraser Valley where, although it was a very scarce breeder, large numbers were resident throughout the year, but increasing in the fall when the run of the various salmon was at its height. Here they confined themselves mainly to a fish diet as this was available throughout

the year. Salmon were largely taken before they had spawned and there were always large numbers of eagles watching the wide shallow estuary of the Chilliwack or Veddar river where it empties into Sumas Lake. Here the salmon, except such species as ascended in June and July when the water was deep, had a very hard time, very large fish were eaten alive as they attempted to cross the shallow bars, a strong fish would often flounder clear of the Eagle's claws a dozen times before it succumbed. This is the exact spot where J. K. Lord saw such numbers about the year 1856; the locality is only a few miles north of the International Boundary.

To ascertain the present status of the Bald Eagle in this region (which is now a thickly populated one), I asked Mr. W. Thacker, of Hope, how their numbers stood in 1920. He tells me that he counted over one hundred in one day while traveling around the borders of Sumas Lake.

But it is on the salt water all the way from Puget Sound to Central Alaska that this Eagle reaches the maximum of its abundance and destructiveness. It is impossible for anyone whose only acquaintance with Eagles is in the east to have any idea of their numbers on this portion of the Pacific coast; except the Raven, in many localities it is the commonest bird and I have often seen forty or more together.

As by far the greater portion of this region is totally uninhabited there is absolutely no chance of their numbers being seriously depleted by any system of destruction induced by a small bounty. The long winding inlets and channels which cut up the shore line of the whole of this region, together with the maze of islands more than doubles the total shore line, and affords a tremendous area (most of which is complete solitude) for the home of countless Bald Eagles.

When fish are easy to capture as during the salmon and herring runs these undoubtedly comprise the bulk of the Eagles' food, but at other times fish are scarce and beyond the Eagles' ability to capture them; crabs may form a good portion of their diet in summer but during most of the winter and up to June or even July Ducks and other waterfowl form the bulk of their food. These are taken in the water, usually after a long chase the victim being picked up as he comes to the surface. The only chance a

Duck has is to get on the wing at all costs. I have repeatedly seen such clumsy risers as Goldeneyes and Scoters get away by shooting to the surface right under the Eagle's tail and instantly taking wing before he can swing around. I have never seen one of these Eagles catch a bird on the wing, although they sometimes make a determined effort even after such strong fliers as Geese, Brant and Pintail.

During April, May, June and July of 1920, while living at Masset, Queen Charlotte Islands, I had exceptional opportunities to note the Bald Eagle's destructiveness as my quarters overlooked Delcatla Inlet, a quiet little tidal creek. Two or three Eagles completely terrorized this place. Every bird, even Canada Geese and Herons, instantly took to flight as soon as an Eagle showed on the wing, showing the dread these pirates inspired. Unsophisticated birds such as Holboell's Grebes that sought a sanctuary in this placid piece of water usually lasted about one day only and then their remains could be found under the favorite lookout trees of the Eagles. The following are the species of waterfowl that I have seen taken—Holboell's, Horned, and Western Grebes, Red-throated and Common Loons, Glaucous-winged Gull, Coot, Mergansers, Mallard, Pintail, Wigeon, Scaup, Goldeneye, Buffle-head, and all three species of Scoter. For some reason the various *Alcidae* seem to be able to elude them.

The grouse of these islands—the Sooty Grouse—have a hard time. As soon as the broods are hatched they are led out by the mother bird to sun themselves on the sand dunes among the small spruces along the shoreline. During this season this trip is carefully covered by low-flying Eagles which quarter the ground just as a Marsh-hawk covers a marsh, except that the Eagle flies a little higher and usually on motionless wings. The result was an almost complete extermination of the Grouse, broods of one or two chickens only were seen in a few places, and twice single chicks without any parent.

A considerable number of Eagles were shot, but fresh birds almost immediately took their place. I should estimate that there were about four Eagles per mile of shore line; in localities of abundant food supply, such as the Whaling Station at Virago Sound, forty or fifty Eagles could be seen in a day.

An exceptionally close observer, Mr. James White, who lives

on the east coast of Graham Island where large numbers of Canada Geese breed, vouches for the damage the Eagle do to these birds, taking large numbers of young birds and also the old Geese when they are in their midsummer moult and unable to fly.

On the north end of Vancouver Island several men, both whites and Indians, accused the Bald Eagle of taking young fawns, but I cannot vouch for this.

A curious fact was the immunity of a large flock of pure white domestic Ducks at Delcatla Inlet. The Eagles never attempted to take any of these although the Ducks fed among the other waterfowl and often wandered far out on the tide-flats. I often saw these Ducks drawn up in a row curiously watching the chase of a wild bird without any attempt to seek cover themselves.

It could not have been their color that rendered them immune as I saw an adult Glaucous-winged Gull killed alongside of them.

On Okanagan Lake in the interior of British Columbia the Bald Eagle preys very largely on Coots during the winter when these birds are out in the open water in large flocks. The Coots have an amazing method of defense. As soon as the Eagle swoops down they mass together and standing up in the water all flap their wings below the outstretched feet of the attacker. This seems to completely baffle the Eagle and I have never known it to fail. After two or three attempts the Eagle abandons the quest. But if any Coot leaves the flock and seeks safety by diving his fate is sealed. Sooner or later he is tired out and neatly picked up as he comes to the surface. Several observers have written of the Bald Eagle in Florida and stating that Coots form their principal winter food supply. These notes are being written at Melbourne on Indian River where the average number of Eagles seen in a short day's travel is about four. An examination of the ground below their resting places seems to indicate that here as on the Pacific Coast Ducks form a large proportion of their diet as far more remains of Scaups was noted than of fish bones.

Later at Jupiter where fish were enormously plentiful and easy to secure Scaups were persistently hunted. It was curious to note how readily the Ducks identified the Eagle. Turkey Buzzards wheeled over them unnoticed, but the instant an Eagle showed over the mangroves every Duck was a-wing.

Okanagan Landing, B. C.

A NEW WARBLER FROM SOUTHERN ANNAM.

BY J H. RILEY.[1]

IN 1918, Mr. C. Boden Kloss and party visited the Langbian Plateau, south Annam, and made a large collection of birds. These were reported upon by Mr. Herbert C. Robinson and the collector.[2] By an arrangement with Dr. W. L. Abbott, Mr. Kloss forwarded a set of the birds to the U. S. National Museum. Among the lot were three specimens identified as *Acanthopneuste trochiloides*. Recently, having occasion to identify a specimen of *A. trochiloides* from Fokien, China, collected by Mr. Arthur de C. Sowerby, it became apparent that the Annam specimens did not belong to that species at all, but were more closely related to *Acanthopneuste davisoni*. They evidently represent a distinct form, however, which I take great pleasure in naming after its discoverer.

Acanthopneuste klossi sp. nov.

Type, adult male, U. S. National Museum, No. 278,561, Langbian Peaks, 6,000–7,500 feet, South Annam, April 17, 1918. Collected by C. Boden Kloss.

Description.—In pattern and style of coloration resembling *Acanthopneuste trochiloides*, but the upper-parts washed with a more yellowish warbler green; superciliary, bend of wing, and under wing-coverts a much deeper yellow; dark crown-stripe on each side of head not deepening on the nape; under-parts heavily streaked with pale lemon yellow, especially on the cheeks, giving a distinct yellowish appearance to these parts, the inner web of the outer tail-feather white almost to the base with only a few irregular dusky markings near the shaft; a narrow white margin on the inner web of the second tail-feather, and an almost obsolete white margin on the inner web of the third. Wing, 54; tail, 40; culmen, 9.5; tarsus 18; middle-toe, 8.5 mm.

REMARKS.—The type and a female from the same locality agree rather minutely, but a second male from the same place is much lighter above and below and is considerably larger. It

[1] Published with the permission of the Secretary of the Smithsonian Institution.
[2] Ibis, 1919, pp. 392–453; 565–625.

has the outer tail-feather entirely white, except for a small dusky spot near the tip and it is more yellowish above and below than *Acanthopneuste trochiloides*, while the dark crown stripes do not deepen into sooty black on the nape. For the present I will have to assign this specimen to *A. klossi*.

Besides the three specimens mentioned above, my material consists of a male from the Tai-pei-shan district of Shensi, China; a male from Hupeh, China; and an unsexed specimen from Nepal, which I regard as representing *Acanthopneuste trochiloides trochiloides*. In addition to these I have a male from Yeng-ping-fu, Fokien, taken in December at an elevation of only five hundred feet. This is darker with more yellowish streaks to the lower-parts than *A. t. trochiloides*, and I take it to represent *Phylloscopus trochiloides fokiensis* Hartert (Bull. Brit. Orn. Club, 37, 1917, 43, Kuatun, Fokien), and the date at which it was taken seems to indicate that it does not migrate far.

A. t. fokiensis and *A. t. trochiloides* agree in having the underparts very pale gray, almost white, with only a few almost obsolete yellowish streaks; the dark coronal stripes deepening on the nape into sooty-black; the white on the inner web of the outer tail-feather merely marginal not by any means occupying the major part of the web. As the above description of *A. klossi* shows it to differ so widely from the two above races, and its relationship to *A. davisoni* is conjectural, I have concluded to describe it as a species.

Acanthopneuste trochiloides harterti and *Acanthopneuste goodsoni* I have not seen, but judging from descriptions alone they seem to have nothing to do with *A. klossi*, though the latter is apparently superficially close. The description of *Acanthopneuste davisoni* Oates (Fauna Br. India, Birds, I. 1889, 420) shows beyond doubt that it is closely allied to *A. klossi* and that the latter is probably only a race of it. Oates compares it with *A. trochiloides*, but does not say that *A. davisoni* is heavily washed with yellow below, nor that the dark coronal stripes differ in any way from that species, so I assume that the Langbian bird is different. Also Mount Muleyit (the type locality of *A. davisoni*) is a long way off from the Langbian Peaks.

Acanthopneuste trochiloides ogilvie-granti La Touche (Bull. Br. Orn. Club, 42, 1922, 55, Kuatun, Fokien) from the description

is clearly only a race of *A. trochiloides* as claimed. The describer clearly states that the white-edging on the outer rectrices was narrow. What I can not understand is how two closely related forms can occur at the same locality except on migration, and as the types of *fokiensis* and *ogilvie-granti* were taken about the middle of April, they must occur in different parts of the Province or at different elevations, in the breeding season.

Acanthopneuste trochiloides and related species at first sight strongly recall certain species, usually placed in *Cryptolopha*, especially *Cryptolopha sarasinorum* of Celebes, but as Hartert (Nov. Zool., 14, 1907, 336) has already gone into the question, I am not prepared to discuss it further at present, except to say that *Cryptolopha sarasinorum* and *Cryptolopha nesophila* have broader and longer first primaries, a shorter wing-tip, and a broader and shorter bill than *Acanthopneuste trochiloides* and should not be associated in the same genus with it. Whether the two Celebes and other related species belong in *Cryptolopha* or not is a question for the future to decide.

U. S. National Museum, Washington, D. C.

GENERAL NOTES

Horned Grebe (Colymbus auritus) in Central Missouri.—Although central Missouri is well within the limits of the Horned Grebe's distribution, it is now by no means regularly visited by this bird. Formerly the Horned Grebe was "a fairly common transient visitant in April, October and November" (Mr. Widmann—1907), but now it seems to be more rarely encountered. For that reason I consider the two following records worthy of publication.

On October 18, 1920, I saw one of these Grebes swimming about among the lily leaves in an artificial pond near Fayette, Mo. The pond was two or three acres in extent, and the Grebe kept as far from me as possible. I watched the bird for about half an hour, using my glasses, and clearly observed the salmon-buff of the feathers of the throat and upper breast. On February 16, 1921, I again saw this bird—or another of the same species, on the same pond. On the latter date there were fifteen Ring-neck Ducks and four Mallards on the pond, and the Grebe was swimming

about apparently unconcerned at their presence. When they flew up, startled at my appearance, the Grebe dived, but by a little patience I was later able to get close enough to see the salmon-buff throat. This, I believe, is characteristic of the Horned Grebe.

The February record is the more important, for winter records, according to Mr. Bent (1919), are for the most part from the Great Lakes Region. —GORDON ALEXANDER, *Marshall, Mo.*

King Eider at Waterford, N. Y.—On April 30, 1922, I observed in the Mohawk River, three miles west of Waterford, N. Y., a pair of King Eiders (*Somateria spectabilis*). The male appeared entirely black except for a pyramidal patch of white covering the breast, point upward; and two large white rump patches, although the head when examined close-by proved to be an indefinite grayish color on the crown. Later the bird rose and flapped its wings causing a white collar two inches wide at the base of the neck and four inches wide in front, to spring into view. At all other times the duck was plain black with a conspicuous red "shield" on its forehead and a white patch on the breast and rump.

The female was a typical Eider with head, neck and breast buffy, the rest of body much darker and heavily barred.

Never having seen an Eider in this plumage, I drew several carefully executed sketches and sent them to the American Museum of Natural History. Mr. Ludlow Griscom in reply said that undoubtedly the ducks were King Eiders, the male having not yet completed molting into the breeding plumage. I consulted a dozen authorities, but could find no description of this plumage except in Bulletin 12, 1909, of the American Museum of Natural History, wherein Dr. Frank Chapman describes a specimen taken March 19, on Long Island, N. Y., which is practically the same as the one I saw.

The pair were very tame and were within fifty feet at one time. When I walked toward them, they merely swam slowly away, neither diving nor flying during the hour I watched them.

Eaton's 'Birds of N. Y.' gives no record within 150 miles of here and no spring records in the State, except "to April 27" on Long Island.

There were no abnormal weather conditions at this time.—EDGAR BEDELL, *Waterford, N. Y.*

Woodcock Carrying its Young.—On the morning of Saturday, June 10, at Milford, Connecticut, I saw a Woodcock carry off a young one from before me.

I was walking up a slight hill through a short lane bordered on either side by loose undergrowth, when a woodcock rose from the grass on the north side of the lane, twelve or fifteen feet from me, flew a few feet out to the middle of the lane, and then turned and flew directly away from me, disappearing over the hill fifty or sixty yards ahead. As it rose, I had a clear view of the bird in profile and again, as it turned and went away,

saw it from the rear while it was flying some little distance. The side view showed an abnormally shaped body, much thicker and rounder than one expects to see in a woodcock; and from the rear view, when the bird flew directly from me, I received the same impression.

The bird was close to me, its legs hung down straight below the body, and both tarsi and the individual toes of the two feet were distinctly seen against the sky. The body, I repeat, seemed unnaturally deep from above downward, and this was the first thing noticed from the first instant I saw the bird until it disappeared over the hill. This roundness of form—depth of body from above downward—was due, I am satisfied, to the fact that the old bird was carrying a young one clasped between its thighs. I could not see the young bird as an individual, nor the thighs of the old bird; and the lower thighs and the object held between them appeared only as a part of the body of a woodcock of very unusual shape.

Observations of the well known practice of the woodcock carrying its young are scattered through the literature of ornithology and sport for many years back; but the descriptions given it naturally lack detail. The time for observation is short and the occurrence usually a surprise to the observer. I never before saw anything of this kind. Nearly fifty years ago, Mr. John H. Sage, of Portland, Connecticut, observed the act, but in that case the young bird was held in the parent's claws, and apparently was distinctly seen. There are many reports of the young one being carried between the parent's thighs, as in the case I report—GEO. BIRD GRINNELL, *New York, N. Y.*

Oyster-catcher on the New Jersey Coast.—While on a trip to Seven Mile Beach, N. J., June 18, 1922, with Mr. C. K. Roland an Oyster-catcher (*Haematopus palliatus*) was noted. Our attention was attracted to a small group of Black Skimmers some fifty yards distant, and while examining them through our binoculars we noticed a larger bird among them and almost at the same moment exclaimed "There is an Oyster-catcher." We looked at him for several minutes through our glasses and then tried to work up a little closer, but we had scarcely taken a few steps when the bird true to his wild nature took wing, giving an excellent view of his striking wing pattern as he made off. He flew due south settling on a distant bar where he was lost to view.

Both Mr. Roland and myself are familiar with the bird having observed this species on Cobb's Island, Va.—JULIAN K. POTTER, *Camden, N. J.*

Breeding of the Florida Gallinule in Ontario.—While at a cottage ten miles from Picton, Ont., between Lake Ontario and East Lake, I made the acquaintance of the Florida Gallinule (*Gallinula galeata*), June 4, 1922. As the cottage was on an outlet between the two lakes we had a fine opportunity to watch the pair of Gallinules nesting in the edge of the reeds directly in front of the porch. The nest contained nine eggs, was bulky, built well above the water in rushes and cat tails. Some of

the rushes were bent over it. At morning, noon and evening we saw the birds, always at our meal times and in mid forenoon. They were so fascinating that I kept close watch. The sitting bird would utter a hen-like "kup" or "klack" two or three times, whereupon the mate would come swimming rapidly, practically always from the same direction, answering the call, meeting in about the same spot they would hurriedly greet each other, passing in opposite directions, the one summoned taking the place on the nest at once, while the other fed from the cow lilies. The time of feeding varied from half an hour to over an hour. As we were out often, there was no way of knowing the number of times she was relieved during the day, but for five days we saw them exchange places at least three or four times a day, the nest never being left alone. From the fact that they went in opposite directions our attention was called to the different one going on the nest and we verified this again and again.

Many Long-billed Marsh Wrens (*Telmatodytes palustris*) were building still with no eggs on June 8; a Pied-billed Grebe's nest contained one egg, while a colony of Black Terns had both eggs and young.—ANNE E. PERKINS, M. D., *Collins, N. Y.*

Wood Ibis (Mycteria americana) at Cape May, N. J.—On August 10, 1922, I had the good fortune to see a Wood Ibis sailing high overhead at Cape May Point, N. J.—the southern-most spot in the state.

There was a strong N. E. by N. wind blowing, and the sky was perfectly clear. I was watching half a dozen Broad-winged Hawks and thirty Turkey Vultures which were sailing high above me directly into the wind, suddenly I noticed another bird, with a wing spread about the same as that of a good-sized heron, but with the neck stretched straight out in front, just as the legs projected behind. It kept steadily facing the wind and rising higher and higher until upon lowering my binoculars I found I could no longer locate it with the eyes alone. It occasionally circled as it ascended but beyond a slight deflection of a wing tip there was no motion of the pinions, and the wings stretched at right angles to the body with no curve and practically no bend at the carpal joint. Within the next half hour I saw the bird twice more. Once it was going with the wind out towards the mouth of Delaware Bay, but being in the woods at the time I caught only a momentary glimpse of it. Later I saw it coming back again against the wind at a much lower altitude and I could see the prevailing white color of the plumage, and the black flight feathers, with primaries separated at the tips, the bare head and the rather short square tail beyond which stretched the legs. Altogether I had the bird under observation for nearly half an hour.

While satisfied personally with the correctness of my identification, I felt that some confirmation was desirable as I had never seen the bird in life before. I therefore sent a rough sketch of the bird as it appeared from below and a copy of my field notes to Dr. A. K. Fisher and Mr. Ludlow Griscom, these gentlemen also placed the data respectively before Drs.

Alexander Wetmore, and T. S. Palmer, and Mr. W. DeW. Miller. All five without a moments hesitation pronounced my bird a Wood Ibis.

Although I covered the vicinity several times within the next few days I saw nothing more of the bird.

So far as I am aware this is the first record of the species for New Jersey, although these are several for Pennsylvania.—WITMER STONE, *Academy of Natural Sciences, Philadelphia.*

The Ground Dove in Central Iowa.—On June 10, 1922, I saw a Ground Dove (*Chaemepelia passerina terrestris*) on the outskirts of Des Moines, Iowa, near the grounds of the Wakonda Country Club. There can be no question of the identification as this is a species with which I am thoroughly familiar, and the bird was observed at very close range. It may have been an escaped cage bird as Des Moines is several hundred miles north of the regular range of this species.—CLIFFORD H. PANGBURN, *New York City.*

Mourning Dove (Zenaidura macroura carolinensis) in Northern Michigan.—For a number of years we have had reports of a few Mourning Doves nesting on Drummond Island, a large island some fifty miles southeast of the Soo at mouth of St. Mary's River. Last year we had a report of these Doves seen at Hessel, North Shore of Lake Huron, about thirty-five miles south of the Soo and a report of a small flock some thirty miles to the west.

This year, reports started coming to us in April and were persistant. A Dove was reported in town, and many reported seeing Doves fly up from the road as they motored by at many points south and southwest of the Soo as far as Brevort Lake, Mackinac County, about fifty miles away. We did not pay much attention to the first reports, thinking the parties were mistaken, but as the reports continued we concluded there must be some truth to them. On July 1 to 4, we made a trip through this territory as far as Brevort Lake and found the Doves. Old settlers tell us they had never seen Doves before in this section and no birds at all like them since the days of the Wild Pigeon.

Whether this is a transient or permanent movement only time will tell. Certainly for this year the Mourning Dove is anything but a rare bird throughout the territory mentioned.—M. J. MAGEE AND K. CHRISTOFERSON, *Sault Ste. Marie, Mich.*

Red-shouldered Hawks Using an Old Nest.—For many years a pair of Red-shouldered Hawks have built in the woods of the Gowanda Hospital grounds. For over ten years they occupied the same nest year after year, but three seasons ago built a new one near by, on the edge of the woods, near the main road but not visible from it. This year (1922) they returned March 9, and as usual, repaired the nest. The female began to sit, exact date unknown. On May 12 she was shot under the mistaken impression that she was robbing the chicken yard; crows being really responsible.

For a week the male mourned without ceasing, flew around calling, but not in his usual wild free way, and sat dejectedly on the tree nearby, as he so often did while his mate was sitting, even perching on the side of the nest.

Early on the morning of May 19, not having seen him for several days, I was pleased to see him enter the woods and approach the nest with a new mate. On May 20 she was on the old nest. I had naturally supposed they would build another, as the stale partially incubated eggs would be in the nest. On June 2, she was apparently sitting all day, as she was on the nest late in the day. This action seems unusual, Query, what became of the old eggs?—ANNE E. PERKINS. *Collins, N. Y.*

Hawk Flights at Cape May Point, N. J.—The article in the present number of 'The Auk' on hawk flights on Fishers Island is especially interesting to anyone familiar with conditions at Cape May Point at the other end of the New Jersey coast line.

The flights occur here with the same regularity and under the same conditions, i. e., a strong northwest wind, but the birds congregate over the woodland at the southwestern corner of the peninsula and remain until the wind abates. The broad expanse of Delaware Bay, where it meets the ocean forms a break in the coast-line and the migrants seem to hesitate to cross during the gale for fear of being blown out to sea. It would seem that all of the migrating hawks over a large area drift with the wind southeast to the Jersey coast, which they follow southward until confronted by the broad waters of the Bay. They often continue some distance north along the Bay shore, but eventually congregate as above described. The flights are mainly Sharp-shinned Hawks, but many Marsh Hawks and Broad-winged Hawks are present as well as Pigeon Hawks, and individuals of most other kinds. There is usually a wave or two of Sparrow Hawks too, but they stay out over the open meadows.

The same conditions of wind that brings this congestion of hawks to the southern end of the Cape May peninsula brings thousands of Warblers and other small birds, and there are Flicker and Woodcock flights when conditions are right, exactly like the Hawk flights.

Poles were formerly attached to the tops of the pine and cedar trees, and gunners stationed below slaughtered the Flickers which were continually alighting on them, by the thousand. Since the killing of Flickers has been stopped by law, local gunners have established the Sharp-shinned Hawks as a game bird and regularly resort to the point in automobiles to kill them, during September or early October. In one week in September 1920 no less than 1400 were known to have been killed, one man securing 60. Most of the gunners eat the birds and claim that they are quite palatable.

Unfortunately, while they may be epicures they are usually not ornithologists, and while from the nature of the flight, Sharp-shins constitute the bulk of the bags, many Broad-winged and Marsh Hawks are slaughtered and dead Sparrow Hawks, Whip-poor-wills and Owls are picked up on the

shooting grounds, killed doubtless before daylight, for the "sport" starts early.

Certain "oölogists" who have learned of the slaughter of the Sharp-shins are most vehement in their protests because in many places this species is becoming so rare that it is difficult to obtain sets of their eggs!—WITMER STONE, *Academy Natural Sciences, Philadelphia.*

Nighthawk (Chordeiles virginianus), Roosting on Flag-pole.—Beginning in early May a few of these birds could be seen in the evenings flying about over Jacksonville, Fla., uttering at times their single note "peent," and by the first part of August flocks of from 20 to 30 were in the air during the evenings. One of these birds was observed on several mornings during early July 1922, resting on a five-inch copper ball on the top of a flag pole on a building about 80 feet above the busy, business corner of Forsyth and Laura Streets. It would rest motionless, apparently asleep, and when the sun came up over the building about nine-thirty A. M., it would stretch its wings and fly away.—THOMAS HALLINAN, *Jacksonville, Florida.*

Olive-sided Flycatcher Summering at Green Pond, N. J.—Near Green Pond, N. J., on August 6, I found in a wild partly cut-over valley, well watered and with a sprinkling of dead trees, an Olive-sided Flycatcher. Out of curiosity I returned to this spot August 13 and found the bird in the same tree. While watching him I heard the call of another from the opposite side of the clearing. The first bird appeared to be an adult with prominent crest. It was continually bothered, when it returned from a successful dart with a dragon fly, or other insect, by a third bird of this species which looked like a bird of the year, and was without a crest —at least it showed none. The young bird was less skillful in the air than the old, though it caught some insects. I watched the two almost an hour, but the adult did not feed the other, so I could not establish relationships or whether the birds bred this year where I found them. However, the suitability of the locality; the early date (August 6); the continued presence on August 13, and the presence of a calling adult (quite frequently calling August 13), and an apparently young bird make it appear that the species actually did breed.—CHAS. A. URNER, *613 Cleveland Ave., Elizabeth, N. J.*

Prairie Horned Lark (Otocoris alpestris praticola) in Maryland in Summer.—On June 23, 1922, Mr. Ernest B. Marshall of Laurel, Maryland, shot an adult male and two juvenile Prairie Horned Larks on his farm near Laurel. These birds were presented to the United States National Museum, and are apparently the first record of this subspecies in summer in the state. The adult male, upon dissection, clearly indicates by the enlarged testicles, that it was about to breed again. The young birds, in full juvenal plumage, had the wing and tail feathers fully grown

and were as able to fly as the adult. They were undoubtedly raised in the near neighborhood.

I am aware of but one prior record in summer for the Prairie Horned Lark in the Washington region. Dr. C. W. Richmond has a record of a bird seen and heard on August 11, 1889. This bird was identified as this subspecies only on account of the date and the form *praticola* being the most probable one as a summer bird.—B. H. Swales, *U. S. National Museum, Washington, D. C.*

The Greater Redpoll in Erie County, N. Y.—There appears to be no recorded instance of the capture of the Greater Redpoll (*Acanthis linaria rostrata*) in the extreme western counties of the state. Eaton, however, reports that it has been seen on several occasions in the Geneva area by Mr. Otto McCreary ('Birds of New York,' Vol. 2). The form undoubtedly occurs with common Redpolls (*Acanthis linaria linaria*), whenever these birds visit us in numbers. However, it is not often possible to distinguish the larger subspecies with a glass on account of the restless nature of the individuals composing the flocks.

Personally, I have been able to identify *A. l. rostrata* on but one occasion. On February 4, 1917, I located about two hundred and fifty Redpolls feeding on weed seeds in an open field in East Hamburg. I succeeded in approaching within a very few rods of the birds and recognized four individuals as belonging to the larger form. The light was excellent at the time, and the flock remained long enough for me to separate the four by their larger size and darker coloration. A single Lapland Longspur (*Calcarius lapponicus lapponicus*) was likewise feeding with the flock.

Since that time, I confess that I have tried in vain to approach closely enough to Redpolls to identify the larger subspecies. Careful collecting in our flocks would undoubtedly reveal the presence of *A. l. rostrata*, and probably that of *A. hornemanni exilipes* also. I am convinced, however, that it is possible to distinguish the former in life, providing one can approach sufficiently close to the feeding birds for purposes of comparison. —Thomas L. Bourne, *Hamburg, N. Y.*

Slate-colored Junco nesting at Hornell, N. Y.—On July 11, 1922, a nest of Junco (*Junco hyemalis hyemalis*) containing three eggs and one callow young, was reported to me. It was located at the foot of a hillside near a tract of timber and was concealed under an overhanging clod of earth. On July 25, it was visited again but was empty, the young having left.

This is my first record for the breeding of the Junco in Steuben Co., and as Eaton in his 'Birds of New York' gives no record for the country it seems worthy of record.—Julia Miller, *Hornell, N. Y.*

Strange Feeding Habit of a House Sparrow.—On the evening of June 5, at 8:30 P. M., while passing the front of a brilliantly lit moving picture house on 9th Street Northwest, Washington, D. C., my attention

was attracted by some object fluttering in the air over the middle of the street. A casual glance towards it to assure myself whether it was a Cecropia or a Luna moth became an interested gaze when I discovered that it was neither but a House Sparrow, busily chasing a large Mayfly (*Ephemeridae*) which it eventually captured. It then flew back to the front of the theatre and after resting a few seconds on the arch over the doorway it flew underneath to its nest in the scrollwork over the ticket-box where its noisy reception indicated the presence of a nearly full grown brood of young. To assure myself that the occurrence was not accidental and the result of the bird having been disturbed I watched its operations for some time and was amused to see the facility with which it picked off the moths and May-flies as they appeared either in proximity to the lights on either side of the facade over the arch or within the radius of the lights below it. As the nearest grass-plots are fully two blocks from the nest and the streets offer but few opportunities to obtain food, the presence of the insects at the lights must indeed be providential, though it would be a far fetched theory to assume that the building of the nest in that particular situation was influenced thereby.

I have not previously seen Sparrows feed under these conditions though I have many times observed Pigeons in Chicago flying and feeding in front of moving picture houses on State street and Michigan Avenue.—J. R. Malloch, *U. S. Bureau of Biological Survey.*

Occurrence of the Prothonotary Warbler (Protonotaria citrea) at Dyke, Virginia.—Dyke receives its name from the narrow embankment that extends out for hundreds of yards into the Potomac River. It has a very narrow path down its entire middle, and this, for the most part, supports, upon either side, various trees and shrubs—with an undergrowth of sedge and plants found in such situations. This is one of my favorite places for collecting, and while there on the 15th of July, 1922, with Marten Benson Rowe of Washington, I undertook to "squeak up" the birds in the neighborhood. Among the species that were deceived by the call were two Prothonotary Warblers—both males—and in unusually fine plumage—considering the time of year. They afforded me a shot when they were close together on the same twig, but proved to be a little too far off for a .22 cartridge loaded with No. 13 shot. A few down feathers floated by, but that was all, and the birds made off into the thick undergrowth of the marsh close at hand. Forty years and more ago I collected this warbler in the swampy bayous around New Orleans.—R. W. Shufeldt, *Washington, D. C.*

The Cerulean Warbler at Washington, D. C.—On May 20, 1922, while with a party of the District of Columbia Audubon Society near Chevy Chase Lake, Maryland, about a mile and a half beyond the District limits, my attention was called to a bluish bird playing hide and seek in the leaves about twenty feet from the ground. Automatically raising my

glass (6x) and expecting to identify a Black-throated Blue Warbler, I noticed black streaks on the back, contrasting sharply with the bright blue. A second and better look confirmed my first suspicion that it was indeed the rare Cerulean Warbler (*Dendroica cerulea*). The entire party of seven persons had the bird under observation for six or eight minutes as it flitted lazily from one to another of the lower branches, several times pausing for some seconds on a bare twig. The shining quality of the blue on the head with the black markings on head and back, the white wing-bars, and the dark collar against the white underparts were all commented upon. While I did not particularly notice that the tail was carried high, as noted by Mr. Brewster, the white markings were conspicuous, reminding me of those in the tail of the White-breasted Nuthatch.

This unusual find led me to investigate the exact status of the species in this vicinity, to learn more of its dozen or so occurrences than the mere dates as recorded in the card files of the Biological Survey. Consultation of the catalog of the U. S. National Museum to see who had collected their specimens, revealed the sad fact that in the old catalog by species, from which our cards were copied, *Dendroica caerulescens* of the original catalog had been transcribed as *D. cerulea*, the former name not appearing in the 1859 'Catalogue of North America Birds,' used as a guide at the time the copy was made. One of the specimens was found and it proved to be *D. caerulescens*. This eliminates the records for October, 1859, and May, 1861, given in 'Birds of the Washington Region,' (Proc. Biol. Soc. Wash., XXXIV, 1921, p. 12). Since the publication of that list, Dr. C. W. Richmond's notes on the birds of this region have become available. Consultation of these and a reexamination of my father's notebooks gives full authority for all the records. The eleven definite records for this species about Washington are:

May, 1877, one seen at Arlington, Va., by P. L. Jouy.

May 5, 1888, one taken on Rock Creek, D. C., by E. M. Hasbrouck.

May 11, 1890, one taken on "Va. side of the Potomac" by E. M. Hasbrouck.

May 12, 1899, one taken on Eastern Branch [D. C. ?], by P. Bartsch.

May 29, 1902, one taken at Plummer Island, Md., by W. R. Maxon. One heard in the same tree on May 22, was perhaps the same individual.

May 9, 1904, one seen at Marshall Hall, Md., by W. W. Cooke.

May 15, 1904, one seen at Cabin John, Md., by W. W. Cooke (not A. K. Fisher as previously recorded).

May 3, 1907, one seen at Fort Washington, Md., by W. W. Cooke.

May 11, 1907, one seen at Difficult Run, Va., by W. W. Cooke.

May 13, 1909, one seen by R. W. Shufeldt.

May 20, 1922, one seen at Chevy Chase Lake, Md., by M. T. Cooke. It is reported to have been seen once in fall, but I have been unable to find any definite record.

There are three records of the breeding of this species in Baltimore County, Maryland (The Auk, X, 1893, p. 372; XVIII, 1901, pp. 137–142),

about 20 miles beyond the limits of our territory, and it therefore seems probable that this bird occurs here oftener than the records indicate. Several writers refer to its fondness for the topmost branches of high trees. By the first week of May, in this latitude, the trees are usually nearly in full leaf, and the identification of a warbler in the tops is very difficult. In this connection, it is interesting to note that in 1904 and 1907 late frosts and continued cold greatly retarded the development of the foliage, and in each of these years, the Cerulean Warbler was twice noted in this vicinity.—M. T. Cooke, *U. S. Biological Survey, Washington, D C.*

Defense Note of the Chickadee.—The article on this subject, by Mr. A. W. Schorger, in the July 'Auk' was of interest to me because of having had a similar experience the same spring. My nest was in a low decayed stub, the cavity leading straight down from the top. The locality a swampy woods; the ground at foot of stub being exceedingly spongy and full of water.

I had tapped on the nest site with no results, so thought I would look into the entrance. Bending over I peered in with one eye and was greeted with a sort of gasping hiss not unlike the noise made when the last of the water disappears from a wash bowl. I really thought that standing near the stub had forced water up into it, and that when I moved back a little to bend over it had sucked out again. So I tried treading around the stub and stepping back, but heard no noise. Again putting my eye to the hole I got hissed, and at last determined it was a parent Chickadee. After several experiments I could see part of the operation, the bird rising up a little in the cavity suddenly, and opening its mouth wide to make the noise. Withdrawing some distance the male bird finally alit on top of the stub, and though making no call audible to me the female almost instantly popped out of the entrance and he took her place. The hissing noise, together with the bird's open mouth dimly seen down in the cavity certainly would make the uninitiated think of snakes.—E. A. Doolittle, *Painesville, Ohio.*

Peculiar Note of Carolina Chickadee.—Having read with interest Mr. A. W. Schorger's article in the last number of 'The Auk' entitled, "Defense note of Chickadee (*Penthestes atricapillus atricapillus*)," I might set forth a similar experience that I had with a Carolina Chickadee (*Penthestes carolinensis carolinensis*).

On March 15, 1920, a Chickadee with a bill-full of feathers was seen in my yard; it soon went into a hole in a dead peach stub about seven feet up. On April 1, two eggs, covered with down, were found in the cavity; six eggs were laid in all.

Late in the afternoon of March 28, I tapped on the tree; one of the birds was inside and gave a peculiar note, not a hiss such as Mr. Schorger heard, but more like a little sneeze. This was repeated every time I tapped. Several times the bird tapped on the inside of the cavity. Finally it put its head out of the hole and calmly looked at me as I stood about three

feet away. I withdrew and it went back into the hollow. No eggs had yet been laid.

Five out of the six eggs hatched and the young were successfully reared; they left the nest on the morning of May 5.—E. VON S. DINGLE, *Summerton, S. C.*

Bird Interference on High Tension Electric Transmission Lines.—While changing a live, 3-phase, 13,000 volt line it was observed that the insulators and metal cross-arms were favorite resting places for the Turkey Vultures (*Cathartes aura septentrionalis*), The Florida Crow (*Corvus b. pascuus*), and the Loggerhead Shrike (*Lanius ludovicianus*). The Vultures and Crows will perch upon the insulators, metal cross-arms, or the static ground bayonets and the expanse of their wings is sufficient to produce a short-circuit between the conductors or a ground connection between the conductors and the static ground system. In the case of 13,000 volts, the current will arc 7/10 of an inch through the air to connect with the bird's wing and the arc will follow several inches, often burning up the bird and melting the line fuses. In a slightly different way the Shrikes meet their death and suspend industries which depend on the high tension line for power. The Shrike flies with its grasshopper or lizard to the pole and decides that the sharp end of the tie wire is an excellent place to impale its victim. When the Shrike comes within striking distance of the voltage on the live conductor a flash-over occurs and a bird and a fuse are gone. It is doubtful whether the birds will ever appreciate the danger of this silent, unseen power. These observations were made in South Jacksonville during the summer of 1921.—THOMAS HALLINAN, *Jacksonville, Florida.*

Scarcity of Breeding Birds in Duval County, Florida.—While making a survey of the cold-blooded vertebrates in Duval County during December, 1920; February, March, May, June, September, October, 1921; and January, February, March, April, May, June, July, 1922, our parties of from two to nine observers covered in the aggregate about 925 miles through the different types of woods—pines, palmettoes, cypress, oaks, bays, magnolias, and regions of thick undergrowths as well as fresh and brackish water swamps. After covering all this territory and making a special effort to note the existance of nesting birds, only two observations were made. One was the abandoned nest of a Fish Hawk (*Pandion haliaëtus carolinensis*) on a high tree near New Berlin, noted June 4, 1922, and the other was a Brown Thrasher (*Toxostoma rufum*) with a nest containing four eggs in a thick shrub about three feet from the ground near Orange Park, noted April 23, 1922. In this region, at certain seasons, the migrants were numerous but the resident birds, during this period of observation were relatively few in numbers and in species. This negative evidence concerning the existance of occupied or abandoned bird's nests may be due to this region's position in the zone of abrupt transition from the

near-tropical climate of Central and South Florida to the temperate latitudes to the north.—THOMAS HALLINAN, *Jacksonville, Florida.*

Notes on Birds of Madison, Wisconsin, and Vicinity.

Phalacrocorax a. auritus. DOUBLE-CRESTED CORMORANT.—During the last few years there has been a striking increase in the numbers of this species during migration. On May 1, 1921, a flock of at least 500 was seen to leave the "Widespread" and start northward, the front of the column being about half a mile wide. On April 29, 1922, three flocks numbering about 200, 200, and 50 individuals, were seen flying a short distance apart over Lake Mendota. On the following day there were about 1,000 birds on the lower lakes.

On April 12, 1922, a flock of 14 Double-crested Cormorants was seen over the waters of Lake Monona. They flew in ascending circles, now soaring, now flapping their wings, until they had attained a great height; then suddenly swinging into V-formation, they started southward and were soon lost to view. Their behaviour corresponded exactly with that reported for a Loon (*Gavia immer*) by Barnes (Bent—Life Histories of North American Diving Birds, p. 55); this observation, coupled with the fact that the Loon is rarely if ever known to sail, renders it highly probable that there was an error in identification.

Passerherbulus n. nelsoni. NELSON'S SPARROW.—A fine male was collected near De Forest, Sept. 24, 1921. Although listed by Kumlien and Hollister as abundant at Lake Koshkonong in the fall, this is the only specimen that the writer has seen in this vicinity during a period of ten years.

Nyctea nyctea. SNOWY OWL.—I was informed by Mr. George Williamson that a Snowy Owl spent about ten days in February of this year on his farm on Lake Waubesa.

Bombycilla garrula. BOHEMIAN WAXWING.—This species was present in small numbers during the past winter, from Dec. 24, to March 22, 1922.

Pinicola enucleator leucura. PINE GROSBEAK.—A flock of six was seen on Jan. 1, and another of eight on Feb. 22, 1922, all in female or immature plumage. In both cases the birds were feeding on the buds of the European larch (*Larix decidua*).

The Bohemian Waxwing and Pine Grosbeak, contrary to what might be expected, are by no means common winter visitors.

Buteo platypterus. BROAD-WINGED HAWK.—This appears to be an uncommon breeding species in southern Wisconsin. A set of three eggs—incubation about ten days—was taken near Madison on May 27, 1922, and turned over to Prof. George Wagner of the University of Wisconsin. The nest, situated about 37 feet from the ground in the forks of an oak in the midst of a thick woods, was lined with bark scales, a few chicken feathers, and dry but green oak leaves; outside dimensions 24 x

17 x 19 inches high; inside dimensions 8 x 7 x 5 inches deep. The eggs averaged 1.46 by 1.95, and varied greatly in pattern, from a light wash with lilac to heavy blotches of chocolate. When the nest was discovered both parents, one with a garter snake in its talons, were perched near the nesting tree and showed no concern over my presence; however, as I approached the nest, one of the birds made a few passes in Accipiter style. It is interesting to note that in 1915, a pair of Cooper's Hawks raised four young on the identical nesting site, and this year a pair is nesting but 500 feet from this spot.—A. W. SCHORGER, *Madison, Wis.*

Two Nesting Notes for the Madison Wisconsin Region.

Vireo belli belli. BELL'S VIREO.—On June 9, 1922, I collcted a male Bell's Vireo and took a nest containing one egg. The female left the nest as I approached and was not seen agin. The male was very tame and vigorously protested my intrusion. This is probably the first nesting record for Wisconsin. On July 3, 1914, Mr. William Schorger secured the first state record by collecting a singing male in almost the exact locality, the Winga Lake district, in which I took the nest of June 9. (See 'Auk,' 1915). My bird has been compared with that of Mr. Schorger.

Thryomanes bewicki bewicki. BEWICK'S WREN.—Bewick's Wren was placed on the hypothetical list in the Kumlien-Hollister State List (1903). But as I reported in 'The Auk' (April, 1922), I have seen the birds on two occasions. Yesterday, June 15, I saw a nest with one egg in the bee-yard of Mr. Ed. Ochsneir of Prairie du Sac, thirty-five miles north of Madison. It was the second venture of the wrens, the first nest having contained eight eggs from which seven birds emerged. Five of them were about the yard every day. The first nest was placed in a hollow among the sawdust and shavings of a large covered tin tub; the second in the top of an active bee-hive among sawdust and rags, Access to both was obtained through small openings in covering joints. Although these nests are probably the first on authentic record for the state, I am confident that a few pairs have nested along the Wisconsin River valleys for years.—WARNER TAYLOR, *219 Clifford Court, Madison, Wis.*

Nesting Notes fron Ladysmith, Wisconsin.—The following nesting notes were secured by me in 1911. Never before had I so keenly realized how small the chances really are for a bird to ever leave the nest, not to mention becoming an adult. Circumstancs did not permit very extensive investigation or much time to be devoted to keeping discovered nests under observation but the notes such as they are follow.

SUCCESSFUL NESTS.

1. HAIRY WOODPECKER.—Located May 31, 18 ft. up in a birch tree. Young in nest, left about June 4.

2. PHOEBE.—Located May 29, under eaves of house. June 2, 1 egg; June 4, 2 eggs; June 5, 3 eggs.

3. BALTIMORE ORIOLE.—Located June 1, 35 ft. up in an elm. June 1, four young. Left nest about June 30.

4. BRONZED GRACKLE.—Located June 4, 40 ft. up in an elm. At least one young bird left in safety, probably more.

5. WARBLING VIREO.—Located June 6, 30 ft. up in a basswood, between two small branches. June 10, as I watched the bird on the nest I thought that it sang. June 28, the young (three) left.

6. HOUSE WREN.—Located May 28. Nest was first placed in a tin can in a rubbish heap, but was finally located in a bird-house which I placed nearby. June 23 the house was opened and 8 young found. June 28 the young left the nest, flying with no practice.

7. HOUSE WREN.—Located June 14. Placed in the cavity of a hollow stump. The opening above was roofed over. June 22, 6 young were found.

8. ROBIN.—Located May 28, 30 ft. up in a maple. June 17 young were in nest.

9. LONG-BILLED MARSH WREN.—Located June 12. Several "dummy nests" were found previous to this time but the real nest was much more carefully concealed in a clump of coarse grass, well down and over standing water. Contained 5 eggs June 12; June 19, young were found; June 23, young had left.

10. DOWNY WOODPECKER.—Located June 19, 9 ft. up in a "stub." Entrance was on the under side of a limb. Contained young.

11. RUBY-THROATED HUMMINGBIRD.—Located June 23, 18 ft. up and 10 ft. out from the trunk of a maple. Bird seen several times later brooding.

12. WHITE-THROATED SPARROW.—Located July 3. Nest was flush with the moss in a spruce-swamp, and was well concealed by a blueberry plant. Contained 3 young and 1 egg.

13. VESPER SPARROW.—Located June 27, under low plants; contained 3 eggs.

14. RED-WINGED BLACKBIRD.—Located June 7. Nest was over standing water. Contained 4 eggs. June 12, the nest was visited and the young were found to be growing rapidly; June 19, the young were ready to fly.

UNSUCCESSFUL NESTS.

1. KINGBIRD.—Located June 4, 20 ft. up in a maple tree; June 13, 1 egg; June 17, 4 eggs; eggs destroyed. Cause(?)

2. RED-WINGED BLACKBIRD.—Located May 22; May 22, 3 eggs; June 7, nest visited; four dead young found under three inches of water. Young destroyed. Cause, flood.

3. CHEWINK.—Located May 28. Nest well concealed under tuft of dead grass, contained 3 eggs. Eggs destroyed. Cause (?)

4. RED-EYED VIREO.—Located June 4, 22 ft. up in a maple tree. Eggs destroyed. Cause (?) This tree later blew over.

5. Chestnut-sided Warbler.—Located June 2, 30 inches from ground in hazel bush; June 2, 1 egg; June 3, egg gone; June 4, Cowbird egg was found in nest. (The Cowbird egg remained in the nest all summer).

6. Oven-bird.—Located May 29. Nest was well roofed and concealed and the old bird pretended to have a broken wing almost fooling me into thinking her a young grouse. contained 3 eggs. Eggs destroyed. (?)

7. Oven-bird.—Located May 29. Nest sunken flush with ground and well concealed, contained 2 Ovenbird and 2 Cowbird eggs; June 12, the Ovenbird eggs were hatched. Eggs smashed, young gone. Cause (?)

8. Marsh Hawk.—Located June 19. Nest was in a small clump of "stag alder," and was well built up. June 23, visited nest and found the old bird circling and calling excitedly above a Canada Porcupine which was within 4 ft. of the nest, and was evidently after the eggs.

I forced the porcupine to leave but we two intruders at the same time must have discouraged the bird as the two eggs remained for several weeks. The porcupine must have observed the old bird carefully and "spotted" the nest at a distance as the nearest tree was several hundred feet away.

9. White-throated Sparrow.—Located June 26. Nest was flush with the moss in a spruce swamp. I stepped within a foot of the sitting bird before she revealed the nest to me by flying. Eggs destroyed. Cause (?)

10. Indigo Bunting.—Located June 28. Nest 18 inches from the ground in a hazle bush; contained 3 eggs. Eggs destroyed and the nest tipped partly over. Cause (?)

Out of the above 24 nests 10 were unsuccessful. Although several cases were noticed during the nesting season in which young birds were seen flying about when the nest itself was not actually found, we have no means of telling what proportion of undiscovered nests failed to produce young.

Some nesting notes were secured even when the nests were undiscovered.

On May 2, full-fledged young Crows were seen.

On May 22, a Purple Finch was seen feeding young.

All through June coveys of Ruffed Grouse were to be found, but I believe that if the truth were known it would be found that an even greater percentage of casualties is common among these birds. In 1920, I found three Ruffed Grouse nests. One nest containing 11 eggs produced 9 young whereas the other two were destroyed by skunks. Several nests were found later deserted, and some of the eggs still remaining.

Four nests were discovered but not visited again owing to various reasons. These were: Black-billed Cuckoo, Chestnut-sided Warbler, Least Flycatcher, Warbler (possibly a Mourning Warbler), which held 4 young on June 24.

Two American Bitterns nesting in a marsh nearby were forced to carry food a distance of two miles as a result of drought. They made the trip from sunrise to sunset for more than two weeks, the round trip requiring

something over an hour on the average, although they frequently made it in less time.

A pair of White-breasted Nuthatches appeared during the summer with their nine offspring. A nest of Migrant Shrikes was successful, but unfortunately data were not secured. On May 31 young Maryland Yellow-throats were seen in three separate localities.

While the nests and notes given above seem to overbalance on the "successful" side, I believe this is because young birds are so much more conspicuous than deserted nests. Certainly the difficulties met by some of the above birds show that it is not an easy matter to raise a family in the wilds. The loss of life between the time of leaving the nest and fall must be appalling. Evidences of Ruffed Grouse, Thrushes, Woodpeckers, and other birds killed by Hawks were common all summer. These notes give only a meager idea of the mortality ocurring at nesting time, but to me the following of the histories of nests is a very fascinating pursuit. WALLACE B. GRANGE, *Ladysmith, Wisconsin.*

Scarcity of Arctic Birds in Europe.—Dr. Graham Renshaw, editor of 'Natureland', (published in Manchester, England,) has very recently returned from his trip to the coast of Norway; and in a letter to me, dated the 22d of July last, he says: "My Norway trip was zoologically *most* disappointing! At Hammerfest certainly there were plenty of Ravens; also I saw a few Hooded Crows. On the way to North Cape I saw five seals, but at a great distance; another of the party saw a whale. These however, with a few Skuas, Gulls, and Guillemots (=Loons) made up the lot; it was a regular wash out for me who had hoped to see one or two rorquals, dozens of seals and *hundreds of thousands* of Eider Ducks! What a pity the boat turned back at North Cape instead of continuing to Spitzbergen, where I might have seen the thousands of Little Auk that Professor Newton used to write about!"—R. W. SHUFELDT, *Washington, D. C.*

RECENT LITERATURE.

Stuart Baker's 'Game Birds of India.'[1]—There are many ornithologists who combine with their love of birds a love for beautiful books and to these particularly Mr. Stuart Baker's volumes on Indian game birds will make a strong appeal. Beautifully printed on heavy paper, bound most attractively and illustrated by numerous excellent colored plates by Grönvold, Lodge and Keulemans, they seem to combine all that could be asked for in the makeup of a book.

[1] The Game Birds of India, Burma and Ceylon, Vol. I. The Ducks and their Allies, Vol. II. The Snipe, Bustards and Sandgrouse. By E. C. Stuart Baker. Published by the Bombay Natural History Society.

Since 1896 Mr. Baker has been publishing illustrated articles on the Indian game birds in the 'Journal' of the Bombay National History Society, and in 1908 those dealing with the ducks and their allies were published as a separate volume by the Society, with additions and corrections. The first volume of the present series is a new edition of this earlier work with further additional matter. The second volume covers in a similar way the Snipe, Bustards and Sandgrouse, while two other volumes, to appear shortly, will treat of the Pheasants and Partridges.

The text is full and replete with information on the distribution and life histories of the various species, making a valuable handbook for the sportsman as well as an authoritative work of reference for the ornithologist.

Mr. Baker is to be congratulated on bringing his nomenclature up to date, something that is too often neglected in semi-popular works of this kind. He seems also to have followed the original spelling of the names in most cases, although we notice that *Aix* appears in the emended form *Aex*.

Among the rarer species treated is the Pink-headed Duck (*Rhodonessa caryophyllacea*), one of the most remarkable ducks from the standpoint of coloration. It may not be generally known to American ornithologists that a full plumaged male of this species is preserved in the collection of the Philadelphia Academy, being part of the famous Rivoli collection. We can heartily recommend this work as an authority on the Indian Game birds and while we await the appearance of the subsequent volumes with interest, we congratulate both author and publishers on a fine piece of work admirably brought out.—W. S.

Mathews' 'The Birds of Australia.'[1]—The two latest parts of Mr. Mathews' work conclude the treatment of the Sylviidae, although, through an apparent error, these birds as well as the Bablers are included in the family Orthonycidae in the "contents" of Vol. IX which accompanies part 9.

The treatment follows that of recent issues, subspecies being discussed at length in the text but placed in the synonymy of the species. The difficult Grass Warblers and Brown Tits are considered in much detail, and as a result the author places all of the latter as subspecies of *Acanthiza pusilla* including *A. ewingi* and *A. diemenensis*.

We notice one new subgenus *Subacanthiza* (p. 449) for *Acanthiza lineata* and the following new subspecies: *Cisticola exilis diminuta* (p. 373)' Cape York; *C. e. exaggerata* (p. 373), S. Victoria; *Acanthiza pusilla lingeraudi* (p. 430) Lingeraudi; *A. p. dundasi* (p. 431), Lake Dundas, W. Australia; *A. p. northi* (p. 431), Wilson's Inlet, S. W. Australia; *A. p. cobborensis*

[1] The Birds of Australia. By Gregory M. Mathews. Vol. IX.–Part 8 (May 22, 1922) pp. 361–416. Part 9. (Aug. 3, 1922) pp. 417–518. H. T. and G. Witherbp, London.

(p. 432), Cobbora, N. S. Wales; *Pyrrholaemus brunneus milligani* (p. 489), Wongan Hills; *P. b. kalgoorlii* (p. 489) Kalgoorli; and *P. b. centra* (p. 489), Central Australia.—W. S.

Lucanus on 'The Mystery of Bird Migration.'[1]—Friedrich von Lucanus, President of the German Ornithological Society has prepared a volume bearing the above title and treating of the various aspects of the migration of birds. Some idea of the scope of the work may be gained from the headings of the various chapters: Historical Review; Bird-banding; The Migration of Certain Species from the Results of Bird-banding; The Origin and Cause of Migration; The Direction of Migration and the Migration Route Problem; Orientation of the Migrating Bird; Relationship between Weather and Bird Migration; The Height of the Flight; The Velocity of the Flight; The Return in Spring; Peculiar Habits of the Migrating Bird. There follows an account of the Bird Observation Station at Rossiten and a brief chapter of Conclusions. In the latter, the author states that the autumnal flight of European migrants takes a westerly or southwesterly direction, and that for certain species a definite migration route may be designated. A migration route, he points out, is not a narrow highway but a broad, though well defined, area which is however not so wide as the breeding area.

In Europe there seem to be three principal routes (a) the west coast, and (b) the Italian-Spanish route, both of which cross the Mediterranean at Gibraltar; and (c) the Adriatic-Tunisian route which crosses by way of Sicily. He further states that birds of the same species and from the same breeding-zone may follow different directions on migration and seek different winter quarters, while between the direction of the flight and the geographic position of the breeding grounds there is no necessary connection. Birds from the same breeding spot flying in the same direction do not always attain the same destination but winter at some point within the migration path. The migratory impulse is also variably developed in different individuals.

Birds, moreover, do not reach their winter quarters by the shortest route but often make considerable detours. Our author also states that the autumnal migratory instinct awakens much earlier in birds of the year than in the adults, which results in a separation during migration.

In the spring the migrant has always the impulse to return to its home i. e. birth place.

The work is a valuable contribution to the subject of migration and contains much important data especially in the summary of recoveries of banded birds reported in various publications.

[1] Die Ratfel des Vögelzuges. Ihre Losung auf experimentellen Wege durch Aeronautik, Aviatik and Vögelberingung. Von Friedrich von Lucanus. Langenfalza, Hermann Beyer and Sohne (Beyer and Mann) 1922. pp. 1–226, four text figures and a plate.

The whole subject is however treated wholly from a European point of view and but few contributions to the literature have been consulted except those by Germans, French or some of the English writers. Naturally in failing to consult American publications much important data bearing upon the more general problems of migration have been omitted. The experiments of Dr. Watson with terns on the Dry Tortugas and the numerous papers by Cooke and others cannot be ignored without seriously impairing the value of an author's conclusions.—W. S.

Van Oort's 'Birds of the Netherlands.'[1]—Parts 13–14 of this notable work consist, like those immediately preceding, wholly of plates, which are quite up to the standard. They consist of a Vulture, several Hawks and Eagles, the little Rails (*Porzana*) and, of special interest to Americans, various of the shore birds including species common to both sides of the Atlantic.

These show the Phalaropes, Golden Plover, Knot, and other species, in their various plumages while the large size of the figures—too large perhaps from an artistic point of view for the size of the sheets, nevertheless make it possible to show details of coloration with great accuracy.—W. S.

Scoville's 'Wild Folk.'[2]—In this little volume, Mr. Scoville's facile pen has sketched vivid pictures of the lives of various wild animals and birds which are most fascinating reading for those who enjoy the great out doors and like to have their information presented in the form of nature-fiction, if we may so term it. "True stories about the wild folk', the publishers call them and so they are in the sense that the novel is a true story. But the novel is not history nor biography and we personally prefer nature-history and nature-biography and therefore we like Mr. Scoville's work best when he is describing actual incidents of his own observation, and had hoped that he would follow in the footsteps of Bradford Torrey, Frank Bolles and others of that school.

All forms of nature writing, however, have their place in literature and Mr. Scoville has acquired a high ability in his chosen field. His backgrounds based on personal studies are charming, and the lives of his characters skilfully and cleverly sketched. Only one chapter in the present volume treats of birds; "High Sky," in which a fanciful picture of the migrating host of birds is followed by accurate data based upon Professor Cooke's papers on the migratory routes of many species. While this chapter contains much instructive matter the critic might question the Gyrfalcon being driven south by cold as early as the plover flight, or a

[1] Ornithologia Neerlandica. De Vogels van Nederland door Dr. E. D. Van Oort. Martinus Nijhoff's Graven Nage, Afl. 13–14.

[2] Wild Folk. By Samuel Scoville, Jr. With Illustrtaions by Charles Livingston Bull and Carton Moorepark. The Atlantic Monthly Press. Boston. 1922. pp. 1–184, 8 plates, Price $2.

"multitude" of Ruby-throated Hummingbirds migrating together across the sky while the Rose-breasted Grosbeak whose "rose stain" was entirely lost in the autumn had more likely never yet acquired it.—W. S.

Taverner's 'Birds of Eastern Canada.'[1]—A second edition of this valuable work is before us, which presents a very creditable appearance with its excellently printed letter press and attractive plates from color sketches by Hennessey. It will prove of inestimable value in providing those interested in the avifauna of eastern Canada, with just the information they desire and should be instrumental in developing many a young bird-lover into an ornithologist.

We have fully reviewed the first edition so that the generally excellent character and scope of the work is already familiar to our readers.

From a purely technical standpoint we fail to grasp the author's object in granting distinctive headings to certain genera, while others are lumped together, as for instance "*Genus Thryothorus*" and "*Genus Thryomanes*" but "*Genera Cistothorus* and *Telmatodytes.*" If he does not regard the last two as separable, why does he not live up to his convictions and unite them instead of adopting this misleading and inconsistent practice? English names for genera are also rather unfortunate and can prove of little use: i. e. "Ground Warblers for a group including the Chat; "Grosbeaks" for the Rose-breast but "Blue Grosbeaks" for *Guiraca*; and "Yellow-bellied Flycatchers" for all the *Empidonaces*. It is difficult also to see why some of these names should be singular and others plural.

Errors in the systematic index still place almost all the Sparrows in the genus *Acanthis*; the Parula and Worm-eating Warblers in *Vermivora*, etc.

These are purely technical points, however, and will not detract from the great usefulness of Mr. Taverner's book. It seems to us, however, that in a popular work some definite and generally accepted scheme of arrangement should be rigidly adhered to; such publications are hardly the place for exploiting original schemes. We notice incidentally that *Linnodromus* is consistently mispelled.—W. S.

Swarth on 'Birds and Mammals of the Stikine River Region.'[2]—This important contribution covering Mr. Swarth's explorations in British Columbia and Alaska, May to September 1919, has been prepared with the care and thoroughness that characterize all of his publications. The collection made by the author and his associate Mr. Joseph Dixon, comprised 534 mammals and 638 birds as well as other material, including

[1] Birds of Eastern Canada (Second Edition). By P. A. Taverner. Memoir 104, No. 3, Biological Series. Dept. of Mus. Geol. Survey, Canada. Ottawa, 1922, pp. i–iv+1–290 with 50 colored plates (included in pagination).

[2] Birds and Mammals of the Stikine River Region of Northern British Columbia and South-eastern Alaska. By H. S. Swarth. Univ. of Calif. Publ. in Zool. Vol. 24, No. 2, pp. 125–314. Plates 8 and 24 text figs. (Issued June 7, 1922.) Price $2.50.

photographs which are used liberally throughout the text and give one a good idea of the country traversed.

The report consists of: (1) Itinerary and Descriptions of Localities; (2) Topography of the Region and its Bearing upon Animal Life; (3) Zonal and Faunal Position of the Stikine Valley; (4) General Accounts of the Mammals (34 species); (5) General Accounts of the Birds (127 species); (6) Literature Cited.

The Stikine valley, which cuts directly through the Coast Range, connects two wholly different areas—the humid Sitkan region of the coast, with its equable temperature, and the much dryer interior with its wide range of seasonal climate. This river valley, while very old, was choked with ice at no very remote period and with the retreat of the glaciers was again opened up. The advance of the animal life northward again has however, been mainly east and west of the Coast Range, and while various species have extended their range from the interior coastwise down the Stikine Valley and vice versa it has not proven an important channel either from the viewpoint of range extension or migration so far as Mr. Swarth's studies indicate.

The account of the relationship, distribution and habits of the various birds are replete with valuable and interesting data. Most important is that of the Bohemian Waxwing which was found nesting in the vicinity of Telegraph and Doch-da-on Creeks, and eggs and young secured. A beautiful colored plate of the young birds from a painting by Allan Brooks forms a frontispiece to the report.

The account of the Olive-backed Thrush (*Hylocichla u. swainsoni*) is particularly interesting in its bearing on the subspecies problem. Mr. Swarth found this eastern form ranging down to within thirty miles of the coast—the habitat of *ustulata* —and yet showing no trace of intergradation, in fact the specimens were more extreme in the characters of *swainsoni* than examples from the eastern United States! If they are to be regarded as subspecies he says, "it must be on the criterion of individual variation rather than that of gradual blending through the population of contiguous areas." Yet Mr. Taverner in his 'Birds of Eastern Canada' distinguishes a species and subspecies as two different things, saying, "It [the subspecies] differs essentially from a full species by showing intergradations with allied races of equal rank." It seems to us in the face of evidence presented by Mr. Swarth and others, that it is foolish to establish any difference except one of degree between the two, and the rank of many a form will always be a matter of personal opinion. Mr. Swarth maintains his admirable attitude on nomenclature, following the A. O. U. 'Check-List' except where he has evidence which seems to him to warrant the recognition of forms as yet not accepted by the A. O. U. Committee. "I have made no attempt," he writes "to be 'up to date' in the adoption of the scores of changes proposed in recent years, not yet acted on by the Committee, and regarding which I have

no new facts to offer or upon which I cannot form an independent opinion." If others would adopt such a common sense attitude our nomenclature would be far more stable and understandable.

Forms the recognition of which he advocates, and which are not yet on the A. O. U. List, are *Dendragapus obscurus fleminġi, D. o. sitkensis, Canachites canadensis atratus, Loxia curvirostra bendirei, L. c. sitkensis, Vermivora celata orestera, Dendroica coronata hooveri, Penthestes gambeli abbreviatus,* and *Planesticus migratorius caurinus. Junco hyemalis connectens* of Coues is resurrected as applying to the form breeding in the Stikine Valley with an exhaustive discussion of the case, and of the relegation of this and other puzzling forms to hybrid origin.

Mr. Swarth is to be congratulated upon another notable contribution to the zoology of the north-west.—W. S.

Lönnberg and Rendahl on the Ornithology of Ecuador[1].—This paper is based on collections presented at different times to the Royal National History Museum at Stokholm by Mr. L. Söderström, Swedish Consul at Quito. There is, first, a list of the characteristic species of each zone with a comparison with Chapman's lists for Colombia, and then an annotated list of all the species contained in the collections, with notes on several by Mr. Söderström. The following are named as new: *Nothocercus plumbeiceps* (p. 13) Baeza; *Odontophorus söderströmii* (p. 16) Napo; *Momotus lessoni gualeae* (p. 51) Gualea; *Oreotrochilus chimborazo söderströmi* (p. 56) Quillotoa; *Heliothrix auritus, major* (p. 61) Pisagua; *Pseudocolaptes johnsoni* (p. 69) Baeza; *Tityra nigriceps gualeae* (p. 75) Gualea; *Iridophanes pulcherrima gualeae* (p. 83) Gualea, and *Pyranga rubriceps rufistigmata* (p. 86) Baeza.—W. S.

Wetmore on Bird Remains from the Caves of Porto Rico.[2]—This is a final report on the bird bones collected in the caves of Porto Rico by Mr. H. E. Anthony in connection with his well known researches on the extinct mammalian fauna of the island.

Forty-two species are represented of which all but seven are birds now living on the island, bodies of many of which were doubtless carried into the caves by two species of owls which frequent them and whose skeletons were also found there. The seven extinct species were previously described and named by Dr. Wetmore, and in the present paper the bones upon which the diagnoses were based are figured.—W. S.

[1] A contribution to the Ornithology of Ecuador. By Einar Lönnberg and Halmar Rendahl. Arkiv. F. Zoologi. K. Svensk. Vetsakad. Band 14, No. 25, pp.1–87. May 11, 1922.

[2] Bird Remains from the Caves of Porto Rico. By Alexander Wetmore, Bull. Amer. Mus. Nat. Hist. XLVI, Art. IV, pp. 297–333. May 22, 1922.

Shufeldt on Subfossil Bird Remains from Bermuda.[1]—This paper originally prepared for publication by the American Museum of Natural History is based upon a collection in that Museum, the Mowbray collection in the U. S. National Museum, together with collections made by Messrs. Edward McGall and Anthony Tall, most or all of the last, we understand, being now in the Carnegie Museum at Pittsburgh.

Dr. Shufeldt refers the material which is very extensive and mostly in an excellent state of preservation to three forms, *Puffinus mcgalli* (p. 354) *P. parvus* (p. 356) and *Aestrelata vociferans* (p. 365), all of which are here described as new, the *Aestrelata* being identified with the famous "Cahow." Elaborate descriptions and figures of the various bones are presented and relationships with allied species discussed.

Attention should be called to the fact that Dr. Shufeldt's so-called new species are not "new" from this publication as all were published about six years previously in 'The Ibis' (Oct. 1916, pp. 623–635), although no reference is made to this paper nor to an earlier one by Nichols and Mowbray in which it seems likely that some of the same forms are described. This fact was clearly set forth in 'The Auk' (1917, p. 98) and there is no excuse for an author to deliberately ignore an earlier paper based on material similar to his own.—W. S.

Recent Papers by Bangs and Penard.[2]—A new form of *Edolius E. forficatus potior* (p. 25) is described in a recent issue of the 'Proceedings' of the New England Zoological Club, from Anjonan, one of the Comoro Islands, northwest of Madagascar, and a new name *Leptotila fulviventris angelica* (p. 29) is proposed for Sennett's Dove, type from Brownsville, Texas. The name *brachyptera* proving to be a synonym of *fulviventris*. Mr. Penard, alone, describes *Heteroglaucis philippinae* (p. 27) a new Hummingbird from Surinam.—W. S.

Recent Papers by Oberholser.[3]—Dr. Oberholser has several nomenclatural notes in recent issues of the 'Proceedings' of the Biological Society of Washington. He calls attention to the fact that Illiger proposed *Crypturus* as a substitute for *Tinamus* just as he did *Dysporus* for *Sula*, a fact that the reviewer brought before the A. O. U. Committee, as affecting *Dysporus* many years ago, but he was voted down. No name being avail-

[1] A Comparative Study of Some Subfossil Remains of Birds from Bermuda, Including the "Cahow." By R. W. Shufeldt. Ann. Carnegie Museum, XIII, Nos. 3–4, pp. 333–418, pll. XVI–XXXI. April 25, 1922.

[2] A new form of Edolius forficatus (Linne). By Outram Bangs and Thomas E. Penard. Proc. N. E. Zool. Club., VIII pp. 25–26. May 1, 1922.

The Northern Form of *Leptotila fulviventris*. By Outram Bangs and Thomas E. Penard. *ibid* pp. 29–30. May 8, 1922.

A new Hummingbird from Surinam. By Thomas E. Penard. *ibid*, pp. 27–28. May 1, 1922.

[3] Notes on the Nomenclature of the Genus *Crypturus* Illiger. Proc. Biol. Soc. Wash., 35, pp. 73–76. March 20, 1922.

able for the Tinamous known as *Crypturus*, Dr. Oberholser proposes *Crypturornis* (p. 74) with *C. cinereus* as type, listing all of the fifty known forms, for the purpose, we suppose, of receiving credit for the "combinations" should zoologists ever revert to a double citation of authorities, and like the botanists regard every new combination as a holy thing to be sought out and catalogued. This listing of all known forms every time a generic name is changed is one of the idiosyncracies of nomenclature that might we think well be dispensed with by all, as it is by most. ornithologists.

Dr. Oberholser also points out that[1] *Inocotis* Reichenbach is antedated by *Pseudibis* Hodgson, and claiming that *Cymindes* Spix is a different name from *Cymindis* Cuv., he substitutes it for *Rostrhamus* Less.

Since, however, we all know that the last word has not been said on the question of what constitutes a different name and there is no general agreement on the matter, it seems folly to overturn well established names on such grounds. They should be left in abeyance until the matter is settled. Dr. Oberholser also revives *Habia* of Blyth and fixes it upon the group now known as *Phoenicothraupis*, necessitating the listing of all of these forms under the new generic name.

In spite of the fact that we do not agree with all of his conclusions, however, Dr. Oberholser is performing a thankless task in setting forth clearly all of these nomenclatural tangles that have to be settled some day and into which few of our ornithologists care much about delving.—W. S.

The Ornithological Journals.

Bird-Lore. XXIV, No. 3. May-June, 1922.

Bonaventure Island and Perce Rock. By Harrison F. Lewis.—A great protected nesting colony of Gannets, Murres, Gulls, Cormorants etc., which "can be visited with ease and comfort."

Two Hummingbird Photographs.—By A. R. Coleman.—Of brooding and feeding birds.

City Birds. By Anne H. Gaylord.—Seventy-six species seen in a small wooded tract in the suburbs of Atlanta, Ga., in fifteen months, eleven resident.

Factors Contributing to the destruction of Birds' Nests and Eggs. By I. N. Gabrielson.—Data on fifty nests—24 destroyed by human agency, 12 by cats or natural enemies and 13 by storm and flood.

Bird Bathing. By E. R. Driver.—Groups birds as "soakers," "dippers" and those that bathe in wet foliage, heavy dew sprinklers, etc. Bird-bath notes by numerous contributors follow.

The educational leaflet treats of the Green-winged Teal. The seasonal reports from various parts of the country are as usual, full of important data, while the Audubon department gives the latest news of bird protection especially the report on the Egret situation in Florida, which is

[1] Ibid, p. 79.

stated to be still "the worst slaughter-grounds for water birds in the United States," while it is the opinion that the Heron family is rapidly approaching extermination in Central Florida.

Bird-Lore. XXIV, No. 4. July-August, 1922.

A Bird Sanctuary in a Small Residential Garden. By Geo. S. Foster.—Excellent description of how one's garden may be made attractive to birds.

A Hummingbird Waif. By Mabel Osgood Wright.—Care of a nesting bird.

My Neighbors, the Nighthawks. By S. R. Mills.—A nesting on a roof at Kingston, Ont.

Joseph Pollah also contributes some admirable photographs of a Yellow-billed Cuckoo at the nest and A. D. McGrew some of the Yellow Warbler. In the Audubon Department Dr. A. A. Allen has an instructive article on Nest-Building and Egg-Laying. There is a plate of the Boat-tailed and Great-tailed Grackles and notes on their plumage.

The Condor. XXIV, No. 3. May-June, 1922.

Miscellaneous Bird Notes from Montana. By Charles L. Whittle.—At Great Falls and Little Belt Mountains, with important discussions of the song of the Orange-crowned Warbler and Townsend's Solitaire.

Wasted Ornithological Material. By W. H. Bergtold.—Plea for the preservation of parasites and stomach contents and the recording of weights and body temperatures.

Notes on American Pine Grosbeaks with the Description of a New Subspecies. By Allan Brooks. *Pinicola enucleator carlottae* (p. 86) Queen Charlotte Islands.

The Aleutian Rosy Finch. By G. Dallas Hanna.—A Life History. with a supplementary account of the eggs by Joseph Mailliard.

The Wilson Bulletin. XXXIV. No. 2. June, 1922.

Bird Notes from Southern Wisconsin. By H. L. Stoddard.—Treats of twenty species, with illustration of Cormorants' nests.

Breeding Warblers around Atlanta, Georgia. By Wm. H. La Prade, Jr.

Notes on the Birds of Cumberland Island, Georgia.—A list of 97 species.

A Mild Winter and its effects on the Migration of Birds at Chicago. By C. W. G. Eifrig.—Early migrants as would be expected were early but not those wintering far to the south.

Birds Seen at the Mouth of the Ohio River. By Gordon Wilson.—Wickliffe, Ky., during August and early September.

The Prairie Chicken in East Central Iowa. By Fred J. Pierce.—A valuable historical article with full account of the trapping and marketing of the bird.

There is also an important paper by Leon J. Cole on the Early History of Bird Banding in America.

Dr. Cole was the first to seriously advocate this method of study in America, and in view of the importance that the work has now attained this detailed record of those connected with its inception are important.

The Oölogist. XXXIX, No. 5. May, 1922.

Camp in a Coal Mine. By R. Boulton.—List of birds seen in central Beaver Co., Pa.

The Oölogist. XXXIX, No. 6. June, 1922.

Some Blackburnian Nests. By R. B. Simpson.—In Warren Co., Pa.

Nesting of the Swainson's Warbler in Atlanta [Ga.]. By W. H. La Prade, Jr.

Summer Residents of Camp Meade, Maryland. By L. R. Wolfe.

Yellow-throated Warbler [breeding] in Dorchester Co., Maryland. No author mentioned.

Ground Nesting of the Brown Thrashers. By E. A. Stoner.—Note on same in July issue.

The Oölogist. XXXIX, No. 6. July, 1922.

The Little Blue Penguin. By L. L. Redeck.—With illustrations from photographs.

The Ibis. (11th Series) IV, No. 3. July, 1922.

The Birds of Jhang District, S. W. Punjab. Part II. Non Passerine Birds. By Hugh Whistler.

Additional Notes on the Japanese species of *Oceanodroma*. By Nagamichi Kuroda.

On the Representative of *Corythornis leucogaster* (Fruser) in the Cameroons and the Congo. By James P. Chapin.—*Corythornis leucogaster batesi* (p. 442) Bitye, southern Cameroon, is described as new, and an additional specimen of *Ispidina leopoldi* is recorded.

On the Birds of the Province of Hupeh in Central China. By J. D. La Touche.

The Arabian Ostrich. By Douglas Carruthers.—An historical record of its distribution.

On the Significance of Certain Characters in Some Charadriine Genera, with a Provisional Classification of the Order Charadriiformes. By Percy R. Lowe.—A most interesting discussion on the probable antiquity of many avian forms, and the suggestion that color-patterns "may be even more persistent than bony structural characters," a claim that the reviewer strongly endorses.

In regard to the Plovers the author points out remarkable skeletal and early plumage differences between *Pluvialis* and *Squatarola* and between *Charadrius* (formerly *Aegialitis*) and *Leucopolius*, the two pairs of genera seeming to parallel one another. *Squatarola* and *Leucopolius* the author

would regard as earlier types still persisting while *Pluvialis* and *Charadrius* are modern derivatives "evolved in time as opposed to space." With the former he would place *Aphriza*, *Haematopus*, *Pagolla*, *Arenaria*, etc., and with the latter a few old world genera. A third subfamily include *Vanellus* and other old world and Neotropical genera as well as *Oxyechus*, *Himantopus*, *Eudromias* and *Podasocys*. This is a decidedly novel arrangement but the author is apparently well supported by his facts.

On the Birds collected by Mr. A. F. R. Wollaston during the First Mt. Everest Expedition. By N. B. Kinnear. With Notes by A. F. R. Wollaston—Notes on 60 species with a colored plate of *Pyrrhospiza punicea punicea*.

The Birds of Sind. (Part I). By Claud B. Ticehurst.—A carefully prepared treatise.

Bulletin of the British Ornithologists' Club. CCLXIX. May 20, 1922. Mr. Bannerman describes a collection made by Mr. G. L. Bates in the Cameroon Highlands and proposed four new forms; *Callene batesi* (p. 130), *Apalis bamendae* (p. 131), *Alseonax murinus kumboensis* (p. 131) and *Francolinus bicalcaratus ogilvie-granti* (p. 132).

Kirke Swann discusses Asiatic Kestrels upholding the validity of *Cerchneis tinnunculus dörriesi*.

Bulletin of the British Ornithologists' Club. CCLXX. July 5, 1922. Dr. Hartert describes *Parus caeruleus cyrenaicae* (p. 140) and *Troglodytes troglodytes juniperi* (p. 140) both obtained by him in N. W. Cyrenaica. Col. Meinertzhagen proposes *Certhia himalayana limes* (p. 141) from Gilgit. Mr. Bannerman proposes a new Crested Lark, *Heliocorys modesta saturatior* (p. 141) from Bates' collection in the Cameroon Highlands and J. Delacour a new Parrakeet, *Brotogeris jugularis apurensis* (p. 142) from Camaguan, Venezuela.

CORRESPONDENCE

Group Photographs of the A. O. U.

Editor of 'THE AUK':

I have been trying to collect a full list of the group photographs which have been made from time to time at the various annual meetings of the Union. I hope that any member who has a group photograph not mentioned in the following list will advise the undersigned. There seems to be an impression that other groups were taken at New York, Washington, and Cambridge. The following list includes those photographs which are in the possession of the writer:

New York: Original (founders)	1883
	1913
Washington:	1895
	1898
	1910
	1920
Philadelphia:	1899
	1916
San Francisco:	1915.

Biological Survey,
Washington, D. C.
August 7, 1922.

A. K. FISHER.

Life Histories of North American Birds

Editor of 'THE AUK':

Realizing that no one man can know all there is to know about all the birds and that the completeness of the 'Life Histories of North American Birds' depends upan the coöperation which the author receives from others, I wish to make this report of progress and appeal to your readers for contributions.

Two volumes have been published and the third, containing the Petrels and Pelicans and their Allies, is printed and should soon be out. The manuscript for the fourth volume, containing the Ducks, up to and including the Ring-necked Duck, is now in Washington in finished form and ready for publication. It is not too late to add to this, when I correct the galley proof, any notes of importance on habits or distribution, nor is it too late to substitute any particularly fine photographs for those that I have already selected.

I am now at work on the fifth volume, which will contain the remainder of the Ducks and the Geese and Swans. I expect to finish this during the winter and send it to the publishers in the spring. The life histories are practically all written, subject to revision, but the photographs have not been selected.

I have no notes on the courtship of the American and White-winged Scoters or of any of the Geese, except the Canada, or on any of the Swans or Tree Ducks. I have no nesting photographs of the Harlequin Duck, Barrow's Golden-eye, any Geese except the White-fronted and Canada, any Swans or any Tree Ducks. I should be glad to receive contributions of notes or photographs to fill in any of the gaps referred to above. Or I should be glad to correspond with anyone who has anything else to offer. I am, of course, well supplied with photographs illustrating nests, eggs and young of all the common species, but there are many gaps still to be filled. I am trying to read everything that is published on American birds, but I have no access to private notes, that have not been published, unless they are sent in as contributions. I shall soon begin work on the

sixth volume, which will contain the Herons and Rails and their allies. Contributions for this would be welcome at any time. Contributors will receive full credit for whatever material they send in and, if it is material that I can use, their names will be placed on the mailing list to receive the volumes when published.

Those who have seen the earlier volumes can understand what is wanted. Hoping for some generous cooperation I am

Very truly yours,

A. C. BENT,

Taunton, Mass.

NOTES AND NEWS

DR. MAXIMILIAN FÜRBRINGER, Professor of Anatomy at the University of Heidelberg, died at Heidelberg, Germany, March 6, 1920. He was born at Wittenberg, Germany, Jan. 30, 1846 and received his early education at the gymnasium at Gera. From 1865 to 1869 he studied natural history and from 1870 to 1873 pursued a course in medicine at Jena and Berlin. At an early age he devoted his attention to the subject of the anatomy of vertebrates and in 1879 was appointed Professor of Anatomy and Director of the Anatomical Institute at Amsterdam. In 1888 he became Professor of Anatomy at Jena and in 1901 succeeded to the same chair at Heidelberg, a position previously held by his former master Carl Gegenbaur. Here he remained until his death.

As an avian morphologist and student of the evolution of birds, Fürbringer had few peers and possibly no superior. His great work 'Untersuchungen zur Morphologie und Systematik der Vögel,' in two volumes, which appeared at Amsterdam in 1888 contains an outline classification of birds that was characterized by Prof. Alfred Newton as "unquestionably the most remarkable recent contribution to systematic ornithology." In recognition of this work he was elected a Corresponding Member of the American Ornithologists' Union in 1891 and in 1916 was made an Honorary Fellow. Among his other works may be mentioned a summary of existing knowledge of the anatomy of birds contributed to the Reports of the Second International Ornithological Congress in 1891 and a paper of some 150 pages to the 'Jenaische Zeitschrift für Naturwissenschaft' in 1902. These were followed in 1903 by a Biography of Carl Gegenbaur and in 1909 by a new edition of Gegenbaur's 'Anatomy of Man.' Unfortunately these great works in German are not accessible to most English and American ornithologists although brief notices of the 'Untersuchungen' appeared in the 'The Ibis' and in 'Nature' in 1888 and a review of his report to the International Ornithological Congress on avian anatomy was published in 'The Ibis' for 1903, p. 614. —T. S. P.

HANS CHRISTIAN CORNELIUS MORTENSEN, the pioneer of modern bird banding activities, died at his home in Viborg, Denmark, June 7, 1921, following an apoplectic attack. Although never associated with the American Ornithologists' Union, the name of Herr Mortensen must always be cited when referring to the method of ornithological research that he inaugurated.

He was born at Jonstrup, Denmark, August 27, 1856. receiving his education there and at Copenhagen, where he was also engaged for several years as a teacher. He moved to Viborg in 1888 where he lived for the rest of his life, chiefly engaged with the duties of head master of the Cathedral School. Poor health forced him to retire from scholastic duties in 1919, and the short period of his life that then remained to him, was apparently devoted entirely to the study of birds.

According to his own account,[1] Herr Mortensen first attempted bird banding work in 1890 when he used zinc bands in marking a small number of Starlings (*Sturnus vulgaris*). This experiment was a failure and it was not until 1899 that he used aluminum bands, which in that year were attached to 165 Starlings. The success of this and his subsequent experiments was so great that bird banding as a method of original research, came rapidly into prominence in almost every European country.[2]

The work of Herr Mortensen has been continuous and his efforts were directed particularly to investigations of the migrations of Storks, Teals, Pintails, Starlings and some Raptores, principally Buzzards and Goshawks. Published reports of considerable importance, dealing with the first four species named, have appeared from his pen, mostly in the 'Dansk Ornithologisk Forenings Tidsskrift.' According to a biographical account by Dr. O. Helms, that appeared in the above mentioned journal for September, 1921, Herr Mortensen's list of bird papers covers seventeen titles, almost all of which are based on information secured from over 6000 birds that were banded by him with the aid of a few assistants.—FREDERICK C. LINCOLN.

ROY CHURCH WOODWORTH, an Associate of the Union for the past three years, and a successful man of affairs of Kansas City, Missouri, died suddenly of heart disease at his home on June 29, 1922. He was born in Middlebury, Indiana, September 30, 1877, and moved to Kansas City with his parents when he was ten years old. After passing through the public schools there, he attended the University of Michigan for six years where he graduated from both the academic and law departments and won many collegiate honors.

Unlike most modern business men Mr. Woodworth had a rare appreciation of the elusive harmonies and subtle beauties of nature, and spent

[1] 'Fra Fuglemaerkestationen i Viborg.' Dansk Ornithologisk Forenings Tidsskrift, 1912, pp. 98–127.

[2] cf. Auk, 1921, pp. 217–228. 'The History and Purposes of Bird Banding.' By Frederick C. Lincoln.

much of his spare time in the open places attending more particularly to bird song. His boundless and irrepressible delight in bird music, and his constant and diligent search for authentic information along this line had enabled him to make rapid progress in the study during the past few years, and had he been spared, would doubtless have led to his specializing in this department to some purpose. He was an enthusiastic member of a small group of intensive bird students all of whom can testify to his wholesome and stimulating traits of character, and to whom, as well as to his hosts of other friends, his death was a serious and ireparable loss.—HARRY HARRIS.

Mr. Howard H. Cleaves formerly curator of the Staten Island Institute of Sciences, later with the N. Y. State Conservation Commission and recently managing director of the Natural History Museum at San Diego, has now become secretary of the Wild Life League at Clarksburg, W. Va.

The A. O. U. is deeply indebted to Mr. S. Prentiss Baldwin who has generously financed the publication of the papers by himself, Mr. Talbot and Mr. Lincoln, on various phases of bird banding which have appeared in 'The Auk' during the past few years. To Mr. Chas. L. Whittle we are similarly indebted in connection with the paper on the Arboretum Mockingbird.

As we go to press we are in receipt of the circular of the local committee relative to the Chicago meeting of the A. O. U., October 23–26, 1922. The scientific sessions will be held in the Field Museum of Natural History, where an exhibition of bird paintings and photographs will be arranged to which all are requested to contribute. There will be a field trip to the Indiana Sand Dunes on Friday, October 27, and the usual dinner on Wednesday evening. Headquarters will be at the Auditorium Hotel, Michigan Boulevard and Congress St.

The Committee have evidently planned a most enjoyable program and it remains for the members to make the meeting a notable one. Just as the eastern ornithologists have been responsible for the large attendances at meetings on the Atlantic coast and the Californians at those on the Pacific so the responsibility this year rests on our Members in the Mississippi Valley, everyone of whom should make an earnest effort to be present and take an active part in the program. With the cooperation of those from other districts the meeting should be the most representative that has been held.

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Page xxiv, after line 13, insert CRANDALL, LEE S., N. Y. Zool. Park, New York, 1909.
" 98, line 21, for Lake Chah, read Lake Chad.
" 104, " 29 and 31, for **cascarca** read **casarca.**
" 131, " 18, for deserves, read deserves.
" 135, " 32, for *Dacaeum*, read *Dicaeum*.
" 143, lines 2 and 3, for Lafresnay, read Lafresnaye.
" 148, line 18 from bottom, for Iowian, read Ionian.
" " " 17 " " for Acarnama, read Acarnania.
" " " 11 " " for Ornithologic, read Ornithologie.
" " " 10 " " for Geographie, read Geographic.
" " " 4 " " for Iowen, read Ionien.
" 149, line 14, for less, read more.
" 231, " 4, for **melanocephala**, read **ludoviciana.**
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